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The Secretary
Senate Rural and Regional Affairs and Transport
Parliament House
Canberra ACT 2600

Dear Senators

Firstly let me thank you for holding an enquiry into Peak Oil. While I am writing this letter to you and preparing my submission, in the USA a similar enquiry is underway. I would hope that your research staff assisting, you provide you with information on many of the experts currently before this similar enquiry. The subject of peak oil affects the whole of the world as well as our country and as such I feel that it is far too important for it to be left to both economists and the oil companies to deal with.

Let me introduce myself. My name is David Bell. I am 39 years of age and am a Chartered Accountant. I am also the father of a 3 years old little boy and the impact of peak oil will affect him and his children and his grandchildren more than it will affect myself or my parents generation. I was motivated to present information to your enquiry as I feel it is my duty to make a better and safer world for future generations.

I became interested in the whole area approx 2 ½ years ago when I noticed an article in the Financial Review newspaper. What has ensued is I have watched for the past 3 years many forecasts of oil prices by economists have been continually wrong. Through the information that I have read during this time and the events in the market leads me to the conclusion that a paradigm shift is underway. The latest consensus numbers bandied about by many economists is the price of oil by 30 June 2006 will be US$45/barrel. The information that I have read and will share with your committee leads me to a different conclusion.

Although your enquiry is about peak oil, it is also important to remember that any peak in oil will have effects for natural gas. There are implications for this for our society and economy as well. I will discuss this in my paper. Also oil has strategic implications as well and these also need to be factored into the equation.

If Australia begins taking prudent and considered actions and we as a nation come to grips with the problem, we have a better chance of adapting to the changes that will occur. We are a rich country, with a skilled and well-educated workforce and also have a strong resources base. We also have a stable political system and good community cohesiveness. This will be invaluable when dealing with the impacts of peak oil.

I have enclosed hard copies of articles collected by me as well as interviews in MP3 format of leading interviews with key players in the peak oil debate. There are also a number of power point presentations as well.

Should you have any questions or require any further information please feel free to contact me.

Yours sincerely

David Bell

Inquiry into Australia's Oil Supply

Submission by

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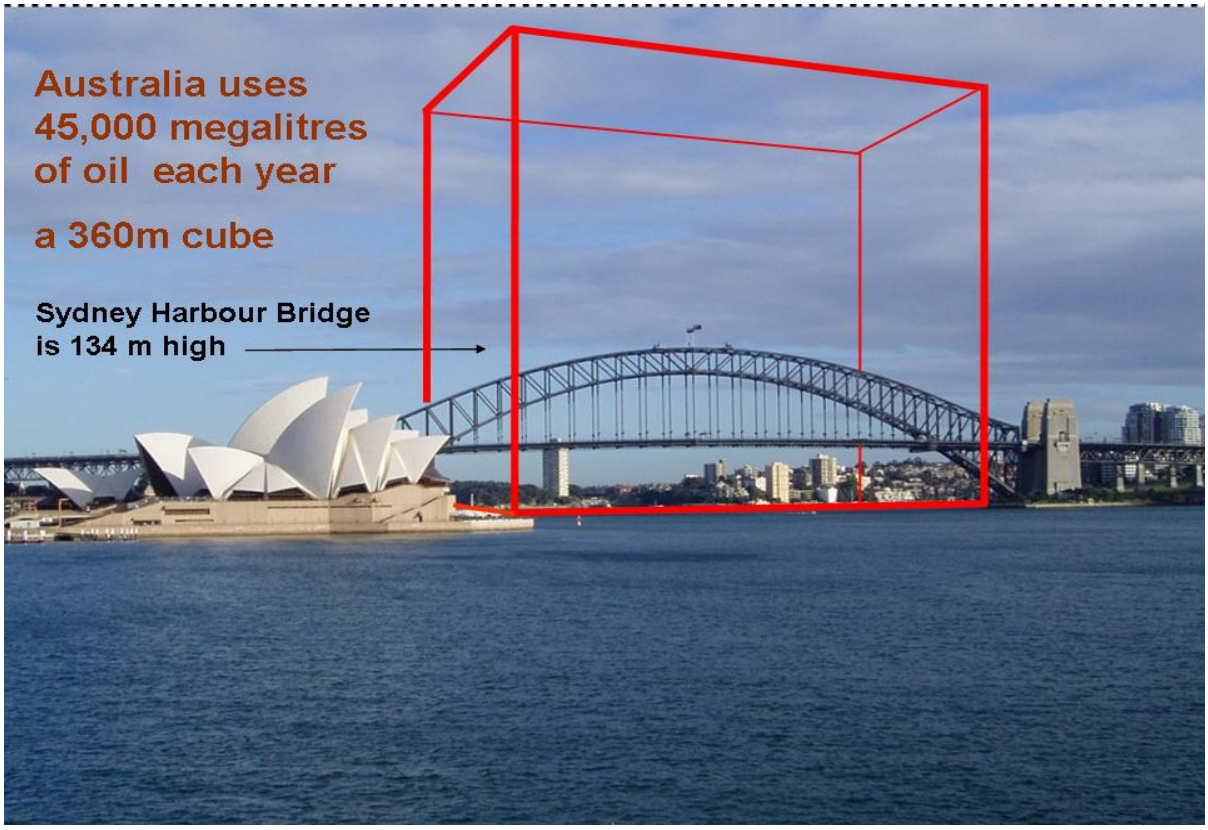

Source Western Australian Sustainable Transport Coalition

Preamble

Oil plays a dominant role in our everyday life it is sometimes easy to miss it. From the day we are born and in some cases before we are born till the day we are finally put to rest, oil affects our lives. We use it not only for transport, as well as in chemicals, plastics, roads etc. It is hugely energy dense source that no other energy source can match. Because of this, it plays such a fundamental role that our society needs an increasing appetite of oil to create wealth. To use the words of President Bush we are "addicted to oil". Australia is no different to the US in this regard.

Its contribution to the success of the 20th Century should be recognized as it was oil that gave us a standard if living unimagined in the 19th Century. However in the 21st Century its importance is changing and in ways we may not even grasp or realize. Whenever major paradigm shifts occur, the people with the most want to change the least. This only slows down our ability to adapt. How well we adapt to this new paradigm will be determined by the actions and he decisions we have all avoided over the last 30 years. This time the problems will not go away.

While your enquiry is preliminary about oil, it is important also to note that natural gas production in North America has peaked and is now in decline. This will have ramifications for mitigating actions for peak oil once it occurs. The need to expand natural gas to keep up with its demand which is growing will begin to also see it peak. My understanding is Australia's natural gas is to peak around 2015, which is less than 10 years away. Natural gas plays an important role in feedstock for both the chemical industry and the production of fertilizer. With the worlds population ever increasing care must be taken not to exploit the resource in the short term at the detriment of future generations. Natural gas fields have extremely steep declines curves as compared to oil so this is just another further complication in this whole energy resource predicament we are beginning to find ourselves.

We also suffer from a lack of good quality information so it is easy to draw the wrong conclusions easily. **The whole area of data reform is essential and I implore your committee to work for data reform.** What concerns me is we will only realize we have a huge problem when it is too late and to get out of it will be extremely hard. The need to get a handle on the problem is extremely important and the need to take action will be important.

There will be the need to take action both at a Federal, State and local level. There will be no time for politicking and blame shifting. It will require business and community groups to change many of their long cherished beliefs and ways of thinking. There will certainly be pain along the way. One thing may well be the fact that some things we have held onto and cherished will need to be jettisoned along the way.

M King Hubbert the father of the peak oil movement predicted in 1956 that the US would peak in 1970. He was derided by many oil company insiders for the remainder of his life. However he was right and they were wrong. In 1970 the US was the world's largest producer of oil at 10 million barrels per day. It now produces around 3-4mbpd. These same people still don't get the fact that world oil will peak and again

they will be wrong. When ever you see flashing lights its time for caution and we would be well served to be prudent.

The Current Situation

Before, we get into this report. It is important to understand much of what is driving oil prices presently.

Hurricanes Rita and Katrina
The Hurricanes in the Gulf of Mexico were the most destructive year on record. The damage alone has been catastrophic and came at time when oil markets were nervous over supply anyway.

This was from Reuters 14th October 2005

The damage to oil and natural gas infrastructure in the Gulf of Mexico from hurricanes Rita and Katrina this year as Compared to Hurricane Ivan last year, based on information from The Interior Department's Minerals Management Service, is as follows:

	Rita	Katrina	Ivan
Platforms Destroyed	66	47	7
Platforms Extensive Damage	32	20	20
Rigs Adrift	13	6	5
Rigs Extensive Damage	10	9	4
Rigs Destroyed	4	4	1
Rigs Unaccounted For	0*	0	0
Number of Pipelines Damaged	28	30	102
Platform Evacuation High	754	660	575
Rig Evacuation High	107	89	NA
Platforms in Storm Path	1600	1300	150

* 3 missing rigs are counted as destroyed

I have included a photo of BHP Biliton's Platform Typhoon rig was which was severely damaged by the storms.
The hurricanes have had the effect of destroying oil infrastructure and creating shortages of badly needed materials such as pipes and rigs. It has also had the effect of delaying important new GOMEX projects as Mad Dog, Atlantis and Thunder Horse. BP chairman Lord Browne said that Thunder Horse will now begin production in the second half of 2006. This should see it ready for production in the middle of the Hurricane season. One hopes next years hurricane season is less severe. However we cannot build an energy policy on hopes. On Monday 4th December in the Financial Review had the following from BHP Biliton's Phil Aiken

Typhoon TLP now

Typhoon TLP then

Aiken indicated the potential for a write-off of the Typhoon oil platform, operated by Chevron, which was severely damaged in the storms. He also said the ramp-up of the group's Mad Dog project has been delayed by around three

months due to the failure of one of the wells, which has to be redrilled, while approval for its Shenzi project has slipped to the first quarter of 2006 as the company reassesses the tension-leg platform technology that was used in the Typhoon platform.

These delays will work to limit supply when demand is expected to increase. There is good news the GOM is recovering as production is brought back on line.

As of Friday 9th December GOM statistics are as follows;

Today's shut-in oil production is 447,425 BOPD. This shut-in oil production is equivalent to 29.83% of the daily oil production in the GOM, which is currently approximately 1.5 million BOPD.

Today's shut-in gas production is 2.347 BCFPD. This shut-in gas production is equivalent to 23.47% of the daily gas production in the GOM, which is currently approximately 10 BCFPD.

The cumulative shut-in oil production for the period 8/26/05-12/09/05 is 100,369,239 bbls, which is equivalent to 18.332% of the yearly production of oil in the GOM (approximately 547.5 million barrels).

(Source Minerals Management Service- Dept of Interior
http://www.mms.gov/

After the record $US70/barrel price the IEA member countries have shipped significant supplies of refined products out of their stockpiles. The US has also sold and loaned significant amounts of oil from the Strategic Petroleum Reserve. The SPR will need to be refilled and all the loans from the IEA and the SPR will also need to be repaid. This will represent additional demand and only increase demand pressure on the price of oil in the 2006 year.

Oil Production

The EIA have said the following in their December 05 outlook

"Many of the same factors that drove world oil markets in 2005, such as low Organization of the Petroleum Exporting Countries (OPEC) spare oil production capacity and rapid world oil demand growth, will continue to affect markets in 2006. Other factors are less certain, such as the frequency and intensity of hurricanes, other extreme weather, and geopolitical instability."

"Worldwide petroleum demand growth in 2005 is projected to slow from 2004 levels, due largely to slower growth in China and the United States. However, world oil demand is estimated to increase by about 1.7 million bbl/d in 2006, up from 1.2 million bbl/d in 2005 (Figure 7. World Oil Demand Growth), led by an oil demand recovery in the United States. "

"Non-OPEC supply outside of the United States is estimated to grow by a net of some 800,000 bbl/d in 2006. New production of around 400,000 bbl/d is estimated to come online from the Caspian region (Azerbaijan and Kazakhstan), with additional projected increases of 450,000 bbl/d from the Western Hemisphere (particularly Canada and Brazil) and 150,000 bbl/d from West Africa. Conversely, natural

production declines at mature fields in the North Sea, Mexico, and the Middle East will dampen this supply growth. Additional capacity increases are projected in OPEC members such as Nigeria, Saudi Arabia, and the United Arab Emirates. "

"As non-OPEC and OPEC supplies increase, world spare oil production capacity will likely increase during 2006, despite a growth in world oil demand. Overall, 2006 will likely see a 1-million-bbl/d increase in spare oil production capacity (to 2.0-2.5 million bbl/d) (Figure 8. World Oil Spare Production Capacity"

If the world was as rosy as what the EIA expects that the world economy has increased spare production capacity, my question is why are they expecting WTI Crude prices to be $63.33 a barrel? This certainly does not fit with what I read in the October 05 UK Petroleum Review "In 2004 effectively all the world's spare capacity was used up in meeting unexpectedly rapid demand growth. The world has now reached the point where the volumes lost to depletion are much larger than levels of likely new demand. They then go on to say "The inescapable conclusion is that oil prices will have to remain high enough to destroy demand, bringing supply and demand back into balance.
Note Petroleum Review uses IEA Sept 05 numbers which forecast 06 demand at 1.8m bpd. Not too far away from EIA numbers.

Oil Demand

Oil demand in 2004 has best been described by some as a "runaway train". 2005 demand has also been strong. The IEA predicts demand to have increase by 1.4 mbpd and the EIA 1.2 mbpd. Both have similar predictions for 2006 IEA 1.8 and EIA 1.7.

Despite high prices there has been little demand destruction. Certainly with increasing demand from around the world demand is not going to fall in a big hurry. The EIA is predicting world demand to reach 84.5mbpd.

At this stage there does not appear that conservation measures are having any effect on reducing demand. According to the EIA demand in the 4th Qtr of 2005 and 1st Qtr of 2006 is expected to be over 85mbpd.

My question is this demand able to be met by supply?

Top 20 Super Giant fields

When you look at some of the largest fields in the world it would appear that most of them are extremely old and most of them have peaked in production while others are getting close. These fields produce the majority of the world's supply of oil.
The unfortunate thing is is we do not have a spare supply of new super giant fields to take the place of these fields.

Half the world's oil resides in the top 100 fields all of these hold 2 billion barrels or more and almost all of them were discovered more than quarter of a century ago. The Super Giants however are in a league of their own.

Here is a copy of the Simmons & Co International Study of Giant oilfields using 2000 data, released 9th Jan 2002.

Source : Matt Simmons – Simmons International
Giant Oil Fields Study
January 9 2002

Country	Field	Date Discovered	Estimated Peak Production		2000 Daily Production
Saudi Arabia	Ghawar	1948	6,300		4,500
Kuwait	Burgan	1938	1,800		1,500
Mexico	Cantarell	1976		N/A	1,211
China	Daquing	1959		N/A	1,108
Iraq	Kirkuk	1927	1,500		900
Iraq	Rumailia North	1958	1,200		700
Saudi Arabia	Abaqaiq	1940	800		600
Saudi Arabia	Shayba	1975	500		600
USA	Prudoe Bay	1968	1,600		550
China	Shengli	1962		N/A	547
Brazil	Marlim	1985		N/A	530
Saudi Arabia	Safinayah	1951	1,250		500
Saudi Arabia	Zuluf	1965	600		500
Iraq	Rumailia South	1953		N/A	500
Abu Dhabi	Bu Hasa	1962		N/A	450
Saudi Arabia	Berri	1964		800	400
Abu Dhabi	Zakum - Lower	1963		N/A	400
Abu Dhabi	Zakum - Upper	1963		N/A	400
Russia	Samoltar	1961		N/A	320
Norway	Ekofisk	1971		N/A	310
Total Production					16,526

In the last few weeks of November and December 05 there have been two major announcements by National oil companies announcing bad news. These have not made the news here in Australia.

These include;

Canatarell – Mexico
Burgan - Kuwait

There is even the possibility that the Super Giant – Ghawar is in decline or close to it. During 2005 the Bank of Montreal issued a report by its analyst Don Coxe in 2005 saying that the Ghawar is now past is peak and in decline. Coxe trashes claims that they can produce more light sweet oil as to date all they have delivered to the market is heavy sulphurous crude. That not many oil refineries can handle. This is why we get the refrain from Saudi Arabia that there are refinery constraints. Coxe also notes that "The kingdom's decline rates will be among the fastest as this decade wanes." This supports what Matt Simmons has been saying that Saudi fields could well be near a state of collapse.

This however has been disputed by Saudi Aramco. No field has ever been found as large as Ghawar and probably never will be. If Ghawar is in decline then any new fields will be needed to offset declines in Ghawar and many of the other super giants already in decline not to cover the new demand coming from the OECD nations as well as China and India.

He is not the only one saying this. Jeremy Leggett in his recent article in the Independent newspaper 20th January 2006 makes mention of a Saudi Aramco insider talking to Colin Campbell that Ghawar probably passed peak in last Quarter of 2004. This is what many in the peak oil community have thought for some time. Saudi Arabian production needs to be watched over the next few years closely.

An interesting aside to this is the technology argument raised by many who do not think peak oil even exists. The giant fields of Saudi Arabia and some of the other giant fields in the Middle East were not found using advanced 3D seismic and other advanced exploration methods. These were found before these methods existed. So given the fact that we now have this advanced technology, why have we not found a swathe of new super giants to replace these old failing fields?

My own feeling looking at the data is that new super giants to replace these old fields do not exist and the advanced seismic technology was really developed to help us look for oil in places where oil is extremely hard to find and of smaller size ie 3km under the sea floor.

Jeremy Leggett quotes BP's former reserves coordinator Francis Harper told the Energy Institute in Nov 2004 "We know how many world class source rocks there and where they are." And then asks the question, wouldn't it be reasonable to think that with modern technology at least one field of 80 billion barrels might have been found somewhere in all the places that the companies have looked these last 50 years? Frances Harper says the following "I'd say there is no North Sea out of there. There certainly isn't a Saudi Arabia."

The super giants are massive fields far larger than anything we can imagine here in Australia. Any declines in these major fields have implications due to their size. It takes many more new smaller fields to make up declines in these giants.

For instance Cantarell at max production produces 2.032 million barrels per day, Burgan 1.7 million barrels per day. These fields have been extensively exploited and the decline rates are enormous. While Pemex the national oil company is insisting that

the decline rate will be 6%, an unnamed engineer in Pemex made the following quote to Oilcast.com on 1/12/05 “The days of the Mexican super giants are over. Pemex is standing in the doorway of depletion. We are in the middle of the Hubbert Curve” He then went on to predict decline rates of 10-20% a year. This could well prove to be correct. In 1996, Pemex doubled production in the field by injecting nitrogen. This action may well have increased production in the short term but it has meant that the life of the field has been shortened. Nitrogen injection is one of advanced recovery techniques cited to boost oil reserves and production rates. It goes to show that regardless of how good these technologies they cannot offset the inevitable. In fact it brings us to the inevitable faster.

Pemex is still expecting to produce 3.4 million barrels a day in 2006, however the EIA expects Mexico to be producing 3.9 million barrels in 2006. This is a 0.5 million disconnect. Pemex is a monopoly producer in Mexico there are no others. I certainly have doubts Pemex can make its figures and doubt even more the EIA’s assumptions. With a 6.5% decline in Cantarell, Pemex will have to boost production by nearly 122K bpd just to stand still. Then they need an addition increase in production of 70K bpd to make their target. If the decline rates are larger than this the numbers just get bigger At 10% its 203K. That is another 81 K barrels a day that needs to cover this decline. This could well come from its new projects. Only time will tell if this happens. They have new projects but it is my understanding they probably will not start at the earliest 2007.

Jerome a Paris in the Daily Kos 26/2/05 noted that Cantarell will be producing around 1.4 mbpd by 2010. He also notes Pemex does not have the technical skills in deep water drilling as the waters of Campeche Bay is shallow not like the Gulf of Mexico. Note Mexico’s constitution forbids foreign partners who can help them. Deepwater is extremely expensive as compared to shallow waters and is extremely challenging technically. The results from deepwater exploration may also turn out to be a lot of dry holes.

Kuwait is another example with Burgan. This is the worlds 2nd largest field after Ghawar in Saudi Arabia. It also made a startling admission that it can no longer produce at 1.9 million barrels per day and its new optimum rate is 1.7 million. Given that fact that once production falls in a field it continues down a slippery slope, I suspect that this rate will be only be able to be maintained for a year at best. This is a field that has been pumping for 60 years. Burgan accounts for more than half of Kuwait’s proven oil reserves. This makes me seriously question whether Kuwait’s proven reserves are overstated. Back in the 1980’s Kuwait along with a swathe of Middle East countries revised their proven reserves upwards. If the production is beginning to slip does this mean the reserves need to be revised down?

The problem is if Burgan is in decline then this signals that more than half of its recoverable reserves are depleted. If this is the case then its reserves are overstated. Kuwait was supposed to hold over 10% of the worlds proven reserves. If the following report is right then the world has lost significant reserves as much as 5%. On Jan 21 2006 an Article appeared in Reuters stating that Petroleum Intelligence Weekly had seen Kuwaiti documents that Kuwait’s remaining proven and non proven reserves are 48 billion barrels, not the 99 Billion barrels stated as being proved. www.energybulletin.net/newswire.php?id=12242

The concern I have is the forecasts by the IEA in world energy outlook. They are predicting that the Greater Burgan field will produce 1.64 in 2020 and 1.53 in 2030. Given the age of the field and the new optimum rate is 1.7m bpd that means it will have to be stable for another 14 years. This seems fanciful and indicates to me that there are obviously problems ahead. This is another reason why I feel that the EIA 2006 outlook for production will not be achieved.

In 2004 Daquing in China was reported by the Peoples Daily of being in decline. It was reported that in 2004 that "China's largest, hit a 27 year low last year. This cut Petro China's export of crude exports to Japan from 3 million tons to ½ million tons. http://english.com.cn/200401/06/print20040106_131970.html

I have only given a few examples of recent major fields in decline but even these should be enough of a wake up call to decision makers there are problems going forward.

I enclose the Giant Oilfields report by Matt Simmons for your enquiry to digest. It is hard for me to give you the full gist of this 67 page report but I will say, his conclusions even then indicated that were problems with the age of the fields and the problems of declining production. The fact that there are very young fields even then indicated we were not finding large enough fields to replace these ageing and declining giants. Given the latest bad news it only confirms some of the doubts Matt Simmons had then.

Are the forecasts real?

The IEA and EIA forecasts especially on the supply side need to be treated with much caution. From the basics review I have done, it would appear that they are at least 1 million barrels a day overstated. The problem appears that some economists fail to see the reality of the problem is the geology is now beginning to affect the oil supply problem. They also seem not to take production declines in major fields.

This was the case when the North Sea went into decline when the IEA and EIA were saying in 2001, that the North Sea would produce 6.6 million barrels per day in 2006 then peak. The problem was that in 1999 the North Sea had peaked at 5.947 million barrels per day. The first nine months of 2005 production has been 4.787.
Source Ron Patterson's Article Revisting International Energy Outlook 2001
www.energybulletin.net/print.php?id=11370

Ron Patterson's article also states that Mexico according to the IEA would exceed 4 million barrels per day and shows little decline out to 2020. This will not be the case with Cantarell now declining by around 14%. Cantarell is 60% of all Mexican production. As I said before Mexico will be lucky to keep its production flat in 2006 and following years and there is no hope of it increasing.

Jeremy Leggett makes the point that in 2000 there were discoveries of 500 million barrels or more. In 2001 there were nine. In 2002 there were two. In 2003 there were none. Half a billion barrels is less than 1 weeks supply. It leaves you cold especially when by 2025 we need 10 Saudi Arabia's. We have not found another let alone

another 9. It is not going to happen. With the decline of the Supergiants the hard question remains is what is going to take the place of them?

Does Peak Oil exist?

From what I have read and the information I have read over the last two and half years, leads me to the conclusion that we are getting close to maximum production of oil. How close I cannot say it maybe a year away or five years away but it is certainly not 30 years away as predicted both by CERA and USGS. I suspect that it will probably occur before 2008.

All prediction models are based on trying to model a future based upon data which is at best opaque and biased. There is a lack of quality data on both a production and a reserves basis that all modelers end up having to make assumptions due to the flawed data they have to work with. This is the reason why there are so many different dates bandied around about peak date. In this circumstance prudence would lead anyone with a sensible and rational mind to think that maybe now is the time to begin starting to take stock of the problem and begin planning for a future with less oil. Certainly caution needs to be exercised when doubt is present.

The unfortunate event will only be realized when we look back and watch production continuing to fall. Thankfully we have not reached that point yet but we can see demand beginning to outstrip supply. If you don't believe it look, at what a barrel of oil was 4 years ago and look at the price since. It has been continually climbing. When demand outstrips supply prices rise.

As the years go by the number of countries go past their production peaks grows and do not recover. It happened to the US 1970 – 10 million now only 4 million and each year the list grows longer. It certainly does not get any shorter. 2006 will see more countries join the list. Mexico is one candidate who will definitely be joining the past peak club.

Australia has reached its peak in 2000 and regardless of access to the latest technology it has not recovered to where it was. It has failed to find new fields to replace Bass Strait and cannot extract what is not in the ground. According to BP Statistical Review Australia produced 809Kbpd in 2000 and by 2004 we were producing 541Kbpd. This is a massive decline over a 4 year period. At the same time consumption has risen from 837Kbpd to 854Kbpd. This now results in us having our deficit of oil going from 28Kbpd to 317Kbpd. In 2004 US Dollar terms we are now importing over $4.4 billion worth of oil No wonder why our current account deficit has not improved. This is despite the fact that we are riding a commodities boom. The line spun by economists is that it is consumer spending. It certainly looks like the consumers of oil are the problem. What concerns me is what will it look like once our terms of trade decline?

Emeritus Professor of Geology at Princeton University Ken Deffeyes is convinced it has occurred this year. He is claiming that under his definition of peak as being at 50% of total world reserves. He is claiming that according to his calculations it occurred when the world's cumulative production had passed over 1 Trillion barrels.

Other academics and scientists using different modeling come to a date of 2010. Not that is a long time away to go or prepare for the event. We will only find the answer out for the coming years. We cannot get an instant answer nor can we know either way till it has occurred.

I will not attempt to analyze the complex peak oil modeling of the Association for the Study of Peak Oil, but when I hear people like James Schlesinger, using their numbers before the US Congress's own enquiry into peak oil then it appears to be that the world has a problem. This is a man who was the energy secretary as well as head of the CIA. Obviously he is a person well connected with oil politics.

He is not the only one Matt Simmons a Texas investment banker and adviser to the Bush White House on Energy matters has said similar things. He has done much analysis of Saudi Arabia and his new book Twilight in the Desert and he comes to the conclusion that Saudi Arabia is at or near peak. Simmons in the late 90's was warning that the North Sea was in danger of collapse. By 1999 the North Sea oil and gas production peaked and has faced dramatic declines. The North Sea was high quality light sweet crude. It was the North Sea and Prudoe Bay that helped reduce the prices OPEC could charge in the 80's and 90's as technology enabled us to get maximum production rates out. The North Sea is now in collapse and the UK is now once again an oil importer. Its North Sea gas is also is a state of collapse and the UK is now faced with buying natural gas from Russia.

Unfortunately most models assume that the Middle East can continue to grow and grow. What most worries Simmons is Saudi Arabia will not just decline but collapse, due to the fact that the super giant fields have used advanced technology to pump water into the flanks of the field to maintain reservoir pressure. This keeps production high for longer but ends with large declines when reservoir pressure collapses. Water Flooding was developed by Aramco prior to nationalization to boost production and increase recovery. It allowed US oil companies back then to extract more oil than they would have been able to, had they taken a less aggressive approach to extraction. The Saudi fields especially Ghawar has lots of problems especially with water cut. This is when water is coming out instead of oil. The problem is keeping the water down. At Ghawar presently they are pulling out over 30% water and are at near the point where collapse begins. They have used all the tricks such as intelligent wells that shut down when water is reaching maximum limits. However running wells at maximum production rates to keep up with surging demand, with such problems is a recipe for collapse.

At the current enquiry on Peak Oil in the US congress Prof Kjell Aleklett President of APSO made a presentation on the topic. Professor Aleklett also presented information from the Swedish Academy of Sciences. I have enclosed a copy of it. The surprising thing for me is that many of these people devote significant time and energy to a problem without funding from governments, who should be paying for the important research that they are doing. Many of them are even retired and at a time most people wind down these scientists are putting enormous investment of their time researching this problem. Source www.energybullet.net/print.php?id=11621

Professor Aleklett made the following quote "fifty years ago the world was consuming 4 billion barrels of oil a year and the average discovery rate was around 30

billion barrels per year. Today we consume 30 billion barrels per year and the discovery rate is dropping towards 4 billion barrels per year" He also questions whether we can find enough oil to offset declines and cope with new demand. He uses Dr Husseini's quote that to achieve the global demand of 122mbpd in 2030 of the EIA and offset declines in current fields "we would new production that is of the order of 10 new Saudi Arabia's" This seems to me to be totally infeasible given current results from exploration.

Representative Roscoe Bartlett a Republican from Maryland has given many speeches about this whole area of peak oil. He is a man trained as a scientist and he is very convinced that peak oil is a huge problem. Bartlett's speeches need to be read and I would suggest that your enquiry take the time to read them. Bartlett even advocates a "Manhattan style" research effort to mitigate the effects of peak oil, and develop new energy sources. These appear on the Congressional record. I urge your committee to both read them and if possible speak with Bartlett. www.bartlett.house.gov
I have enclosed a copy of his speech from 20th April 2005

However the peak oil debate although not mainstream has brought people from what would be called the Green left, people such as Jan Lunburg, Richard Heinburg, Julian Darley and Pat Murphy can all get on a stage with Political Right on the subject, hold a sensible debate then I know there is a problem. They may have different mitigating actions but they all can accept the inevitable without sticking their head in the sand.

Peak oil affects us all. It does not distinguish between political viewpoints

In the UK Sunday Telegraph Dr Al-Husseini, retired Chief of Saudi Aramco pointed out that Saudi Arabia could only ever get to 12.5 million barrels yet they are somehow to get to 25 million according to IEA and EIA forecasts we certainly have a problem. He lambasted the forecasts of what outsiders think Saudi Arabia can produce. He gave short shrift to IEA and EIA forecasts as being totally unrealistic. As someone who intimately understands what the Kingdom oil reserves are, he is more than competent to speak on Saudi reserves and production capability. He was known to be the smartest in Aramco on technical matters and had been warning that problems existed before retiring. Dr Husseini was quoted as saying "The West is deluded to rely on Saudi Oil" If this is what he is saying we better start seriously listening.

When I look at Chevron running the promotion will you join us saying we are consuming two barrels of oil to one we find then it is clear some oil companies have a problem. Will you join us is their campaign which runs these advertisements, you get the idea they will have problems keeping their customers easily supplied with product at some time. It also means they can say don't blame us we have the same problem as you. There are some companies who take a different view to this however from some of the analysis I have seen research by others in the Peak Oil community on these companies proving that they too have a problem. www.cheveron.com

The Hirsh report which was written for the US Department of Energy describes Peak Oil as an "unprecedented risk management problem. They recognized the fact the actual date of is hard to predict but the mitigating actions and the magnitude of the problems is where most of our energies should be going. It also states that due to the

size of the oil industry any mitigating actions need to start way ahead of time. It needs to be clearly studied by your committee. I urge you strongly to read this report.

One of the Co-authors of the report Roger Bezdek made a speech at the ASPO- USA in Denver during November of 2005 which left no one in doubt where he stood on the matter. He made the point about the parable of crying wolf that the wolf ate the people. Robert Hirsh has also made a presentation before the US Congress on peak oil. It makes for very interesting reading. One question is why did the US government commission this report? Does it not believe the USGS figures of peak in 2030? Do they as many of us in the Peak Oil Community think peak oil is just around the corner?

From one of the latest IEA reports I have seen and the numbers quoted is that world oil companies will need to spend trillions of dollars on exploration over the next 25 years to keep up with oil demand. There has not been a rush by oil companies world wide to sat this is doable? Are oil companies going to spend this amount of money? Are they rapidly increasing their expenditure budgets to meet the IEA numbers?

Even if the USGS was correct and the peak does come in 2030 as they claim then when will we need to take action? Certainly 25 years is still not a long time. The time taken to bring about new products and new energy sources, retool and restructure industry would gobble this time very quickly. Under this scenario we would have some time to begin implementing the recommendations of the Hirsh report.

Part of the whole problem is the lack of proper transparent data we have no accurate information to work out where we are. Whenever many in the Peak oil movement try to model the data or try to do any analysis, they find that much of information is contradictory.

What is the Decline rate of current production?

As the data is contradictory we suffer from knowing what the actual decline rate in production is. As I pointed out the decline rates seem to be increasing as we are pushing maximum production on many wells far beyond what could have been done years ago. At this stage it was assumed to be around 3-5% however at the ASPO-USA conference there was talk that the decline rate is more like 8%. If this is the case the peak will occur quicker than many predict. If the decline rate is higher than many expect the down slope will be faster than many imagine. The bumpy plateau may mask a cliff, rather than a slow and gentle decline. That will only make mitigating actions more necessary and the effects of peak oil more pronounced.

The question is more how do we fix it and what are the implications?

<u>Data Reform</u>

The question of how far from the top we are has concerned many in the peak oil community. Acknowledging you are in a hole is good. The question is how deep is concerning many. Part of the problem appears to be the fact that much of the data on proven reserves etc is pretty cloudy and murky. The need for data reform and transparency is essential. There are too many in the oil industry world wide that seem,

to have a vested interest in keeping every one in the dark. The problem may well be that when the light comes on it will be too late.

In the presentations by Matt Simmons he has a plan for action on this front. In Matt's own words "this would settle the argument once and for all if there is a problem" My view on this is we need the truth even if we cannot handle the truth. You cannot keep up a charade forever and putting it off only makes fixing the problem harder. **I strongly urge all members of this committee to push for Data reform. We cannot continue to be kept in the dark by OPEC and other large producers.**

The data required is such;

Mandated Field by field quarterly production reports
Mandated table of average well bores by field
Some proven reserve allocation to specific field

As Simmons says "It would take months to implement, but would only take a few weeks to analyse. If anyone refused you would know straight away there was a problem. There is obviously a problem beginning to emerge, supply cannot keep up with demand, prices are increasing, major oilfields are old and in decline and we are finding less oil than we are consuming. If you add these up it you come to the conclusion quite quickly that the peak in oil production is close at hand.

The price of Oil

Given oil will be less available and demand still growing by around 2% on a worldwide basis one does not have to have a PhD in Economics to understand that the price of oil will go up. This is exactly what is happening currently. Supply is getting tighter and tighter. Demand is continuing to grow despite the price increases. The last two years oil has increased by over 30% per annum. It is definitely not falling in early 2006. Oil averaged around US$56.67/barrel during 2005. My own feeling is that oil will average US$62/barrel during 2006.

The market is getting more nervous and prices seem to be gyrating more because of this. This was predicted by Goldman Sachs in March 05 that oil had entered a super spike territory and may reach $105/barrel. Arjun Murti said on Dec 12 the following "his forecast maybe conservative if the peak oil theory is right". He forecasts oil of $50 to $105/barrel until 2009. (Source: bloomberg.com 28th Dec Oil Analysts Wrong since 2001, End Forecasts of Price Drop) It is certainly a wide range for error. It seems to represent the fact that the oil market is now extremely volatile.

CIBC World Markets economist Jeffrey Rubin in his January 06 report predicts that oil will "rise to over US$70/barrel by the end of 2007 and to as much as US$100/barrel by 2007" After reading his report, which I enclose you will see why. He has added in all new oil projects that are to come on line over the next few years like has been done with UK petroleum review of oilfield mega projects but added more smaller projects, he added in new demand and deducted declines in production due to older fields not being productive as they used to be. From reading this I come to the conclusion that he is more right. None of his numbers or assumptions seem to be open to ridicule.

Charles Maxwell an oil industry veteran and leading energy analyst predicted the following as the ASPO-USA conference in Denver in November 05. This is a more conservative estimate than Jeff Rubin or Arjun Murti but still indicates that prices are still on the way up.

Forecast Price of West Texas Intermediate Crude (per Barrel)

Year	USD Price
2006	54
2007	56
2008	62
2009	68
2010	75

Source www.theoildrum.com

Unfortunately, this is in contrast with some Australian economists who seem to still cling to idea that oil will fall. In the Financial review 18th January the chief economists from the Big 4 banks made the following prediction

Michael Blythe –Commonwealth Bank – "Above $55 over the next year and at $55 by the end of 2006 for West Texas Intermediate (WTI)"

Jeff Oughton – NAB – "Prices will ease to around $55/barrel for WTI"

Saul Eslake – ANZ "were assuming rather than forecasting – US $55/barrel for WTI end of 2006"

Bill Evans Westpac – "prices of around US$50/barrel"

The Bloomberg report 28/12/05 that I mentioned earlier surveyed 25 analysts who predict an average of US$58/barrel. The EIA in the US is predicting the average price of WTI of US$63.33/barrel. It looks like our Australian economists seem to be a bit light on as compared to their associates in the US. I get the impression that they will be more wrong than right. I also get the impression that many of them do not realize how tight oil markets truly are.

There is also a belief in oil markets and by many economists that Saudi Arabia still has this magic cushion of surplus production that it and OPEC have. One only has to read Jeff Gerth's piece in the New York Times dated October 28th 2005 titled "Doubts raised on Saudi vow for more oil" indicates that even the US government does not believe the Saudis. www.energybulletin.net/newswire.php?id=10207

Adam Porter in Al Jazeera in Dec 2004 had an article similar called Are the Saudis telling fairy stories about oil? To get the picture that Saudi Arabia could well have trouble ahead. If Iran does cut back its exports we would really see what the Saudi Arabian spare capacity was. It explains why OPEC has been very quiet on this whole issue. If there is any surplus it is in the area of heavy crude which is hard and expensive to refine and which very few companies can refine. It explains why light

sweet continues to increase as its supply is falling but demand is continuing to grow. It also confirms in my mind why if Iran turns off the spigots if pushed prices will surge towards $100/barrel. It would also result in OPEC and Saudi Arabia shown to be straw men.

The Implications

The implications of Peak oil are enormous to say the least. Oil is used in 90% of all transportation we use. It helps us grow food, used to manufacture plastics and chemicals as well as the manufacture of pharmaceuticals

There are many greater minds who have thought about this whole subject but I will say once depletion starts there will be shocks to the economy like we have not seen in along time. Prices shocks will get more uncontrollable and many people and businesses which have been marginal for some time will be pushed over the edge. Oil is already surging and this will continue.

In the recent year, people have begun reacting to the high prices by reducing unnecessary driving, cutting back on some non essential spending. All these have impacts on the economy and the society as a whole. We have also seen in Australia a move away from larger car to smaller cars and motor scooters seem to be more popular than they have ever been. This will only continue.

The idea of air freighting low value commodities around the world will disappear. Cherries from the USA, is one example. These normally arrive in Australia in July. Things like this become more expensive. When fuel eats into consumers pockets such luxuries may go first.

Getting some food to distant markets becomes more expensive. Especially, if the prices obtained do not match the increased costs of both production and transport from higher oil prices. Modern Agriculture relies in cheap oil. Tractors run on diesel and chemicals used in farming also come from oil. This means inputs into agriculture will also increase in price just not the cost of transport from the farm gate. Much oil is used as an input to modern farming. Remote farms in marginal country growing or raising low value commodities may be the first to go. One key input into farming is artificial fertilizers. Most of them are created by using natural gas. Once peak oil occurs there may well be a rush to convert some parts of the fleet to natural gas as well as electricity generation production to natural gas. This will only help to increase demand for natural gas helping increasing the price. One only needs to look at the North American natural gas situation to realize they have production problems.

The costs paid for groceries will only increase and once transport and the production costs continue to rise. There has to be farmers who will no longer be economic and this will affect supply of goods to the supermarket. Farmers will want increased prices to compensate them while retailers will be nervous as their customers will not want to pay higher prices.

I also foresee remote areas being affected by high diesel prices. This is true where these remote communities use diesel generators to produce electricity. These

communities will need to change their way of generating electricity. The government may need to help them financially to transition to solar and wind where possible. They may also need assistance with purchasing low energy appliances to reduce the need for larger systems to generate power. They may also need better designed housing with more insulation to reduce demand on their air conditioning and refrigeration systems.
There will certainly be a reduction in purchasing power for individuals. There could well be some demand destruction resulting in increased unemployment and inflation. This will be different to what happened in 1973 with the Arab embargo where the spigots were turned off. I liken peak oil more to slowly turn them off over a number of years, with some years the turn being more pronounced then others. More like a slow strangulation. However this assumes this assumes that the Middle East and other major oil producing countries, remains relatively stable. If a revolution or civil war broke out we would get a situation more like 1973 and 1979.

What concerns me most with the effect of Peak Oil is our country has built its economic and social progress on oil. Suburbs have sprawled and much of our economic activities are derived from using oil. This will make it harder for us to adapt, so we could well suffer more pain than other countries which use less oil to derive its GDP. We are certainly going to have to pay more for oil and thus less money to spend on other things. This is especially true if oil supply is restricted and current demand cannot be met.

We also have a lot of people on the edges of our suburbs with high levels of personal debt would have problems with increased interest rates being lifted. Interest rates may well need to be lifted if inflation gets out of control. Oil Price spikes only increase the possibility of stagflation happening. They could also have to deal with unemployment. I suspect that Bank repossession of homes could well continue to increase. This could well drive prices of houses down further moving others into the position of having negative net wealth.

Some items which could well change the balance of supply and demand in a minute would be;

- An Attack on Ras Tanura or oil fields by Al Qaeda would starve the world of potentially millions of barrels of oil.
- The Iranian situation gets worse. I suspect that Iran needs to develop its Nuclear power industry so as to maximize its oil and gas revenue. Iran is well past its peak as an oil producer. Weapons programs can be developed in conjunction with a power generation and is an insurance policy against attack by a foreign power to control its oil wealth, should they feel they will be attacked. Nothing is worse than being a rich man surrounded by desperate poor people.
- Venezuela’s political circumstances take a turn for the worse.
- Nigeria also lurches towards civil war. Shell has already evacuated staff after kidnappings and killings.

These events would well cause a super spike in oil prices and severely crimp supply.

Peak oil will affect manufacturing and agriculture where freight makes up a substantial part of the cost of the product. We are beginning to see examples of this in

the US where fertilizer companies are moving to the Middle East where proximity to the natural resources and lower prices are making this occur. Mattel the toymaker in 2005 increased the prices of its toys due to the increase in the oil price. This is despite the fact it manufactures them in China and not the US

One example in manufacturing is the local car industry, has made large 6 and 8 cylinder cars as its mainstay. Holden's parent GM is fighting for its own survival and Holden in 2005 has retrenched workers at its plants. I suspect this may be the tip of the iceberg should prices remain high or go higher. Mitsubishi is also a subsidiary with a sick parent and it would not take much for Mitsubishi in Australia to go the way Nissan and Leyland have gone. None of the manufacturers offer at present offer a high efficiency diesel in their passenger vehicles or seem to have plans for a hybrid vehicle. Toyota offers the Camry in a 4 cylinder engine and this may well entice fleet buyers away from Holden and Ford to a more economical car to run. That however remains to be seen. The new Camry comes in a 2.4 litre engine. It is certainly more efficient than a large 6 cylinder engine. In the US GM and Ford have slashed jobs each by 25,000 and closed plants. Ford is closing 14 plants in all to survive.

Another area where there could be pain is in the area of privately funded motorways. Some may well survive, but others may well and truly many need to be bought back by the government at a bargain basement price. I would suspect that the Cross City Tunnel could be one of these. If people are paying more for petrol they may well drive less, car share or make other arrangements about the way they work to counter this. On ASPSO Australia's website an article about this has now been published.

There could well be bus, airlines and transport companies that will disappear. As purchasing power diminishes and people cut back on non essential spending there could well less travel and spending in the economy. The increases in fuel costs may be able to be passed onto the consumer to a point, but after a while the costs may appear too much for the service supplied. For example families may not travel as far to have a holiday and may actually spend less due to their reduced purchasing power. You also don't take a holiday once you loose your job.

When prices hit $1.45 per liter in 2005, some retailers noticed that consumers just stopped spending. Once oil production starts to fall we will notice that demand and supply really, part-company the price will only go up. This is where we will get into serious demand destruction territory. 2004 and 2005 was where demand outstripped supply but supply was still growing. One can only imagine what will happen once supply begins continually declining. During late 2005 and early 2006 there have been a number of retailers issuing profit downgrades to the Stock market. The latest being the Austin Group. Gowings is under administration and closed its doors at the end of Jan 2006. Myer department store is up for sale so retailing is being buffeted already.

Eventually unemployment and inflation will rise and we could well have to raise interest rates to cool the economy, which only means more unemployment. Stagflation in the 1970's did not occur as some case of bad luck but because of oil supply problems affecting the economy. It was not Alan Greenspan or the RBA governor that was the result of low inflation in the 90's it was the real cost of oil falling that was the real impetus. This allowed more items to be shipped and manufactured at cheaper rates and gave consumers more money in their pockets.

We are now out of this paradigm and inflation and unemployment will reoccur. They certainly will once we past the peak. What we will have to do is take action to remedy the effects of the high oil prices not just raise interest rates by reducing our consumption of oil. Once oil supply begins falling the price can only go up unless demand can be curbed. In the past this has been with people loosing their jobs and no longer driving to work. There was equilibrium restored, prices fell and demand returned. This time demand will fall but at the same time supply will be falling as well. The question remains will supply fall faster than demand?

The increase in oil will also hit the outer suburbs of our cities the hardest. These are the people normally with the lowest levels of income and use their cars to travel due to the lack of adequate public transport available. They are possibly the ones who have the least capacity to adapt to the new oil paradigm. These people will definitely have the most problems. There has been a study by Jago Dodson and Neil Sipe from Griffith University called "Oil Vulnerability in the Australian city" indicating this. This topic of who will be affected most by peak oil has been discussed regularly in the peak oil community and it is now pleasing to see that academics in the world at large are vindicating what is being said in the peak oil community with modeling and research work. I would add that these areas of our main capital cities have high unemployment levels and the people who have jobs have to travel. They also have to travel long distances to go to work and do types of work which precludes them from telecommuting and using the internet. I suspect that they could well also be the ones that loose their jobs first when the effects of peak oil occur. I would also add that they probably drive older and higher petrol consuming motor vehicles. This will mean they will feel more pain than others in the community. It will affect pensioners who rely on their cars as a way of getting around. They will have to make some very hard choices.

There will also be balance of payments issues as well. Higher oil prices will drive the current account even higher. The problem may well be that our exports fall or our export of other goods and services slows. If our GDP falls the servicing ratios of current account to GDP will begin looking like a re run of the late 80's and early 1990's. Many economists have spun the line Australia is a net energy exporter so we are immune. My analysis of our growing oil deficit means we have to export more and more coal and LNG to buy oil. This line will get harder to defend with the oil deficit growing faster than our coal and LNG surplus. I read somewhere that Australian Natural gas is expected to peak in 2015. 9 years is not a long time. This could well be in the middle of steep declines in oil production. Gas fields deplete faster than oil fields. What will happen to the Current account deficit then?

In the UK Times 28th January 2006, has an article "Transport experts have seen the future and it's got pedals" It notes that the UK government's science think tank states: "we cannot presume that we will have cheap oil for the next 50 years"
It also notes that UK society will be less mobile and travel less. Why would it not be the same for Australia?
www.energybulletin.net/newsire.php?id=12390.

I foresee that roads will become more expensive to maintain. Bitumen has always been a cheap waste product of oil refining. If there will be less oil then the price of bitumen will have to rise as the price of oil price does. Refiners add a margin onto

their inputs. Bitumen may also more extensively cracked by refineries to strip out more volatile hydrocarbons which could be made into higher value products. The availability of bitumen has grown as oil production has increased. How do we repair roads and build new ones with a shrinking resource? It leads me to think that some roads will revert back to dirt ones as they did in earlier times.

Geopolitical Implications

If there is a declining resource base and people fighting over access to it you can be rest assured that wars will occur. We are already seeing the US seeing China as a competitor for oil and blaming China and India for rising prices. We have seen China's CNOC effectively shut out of the bidding for Unocal. China is beginning to court Iran for more oil. China is developing a blue-water navy obviously to ensure that its tankers are not frozen out of the sea lanes as the US did to Japan in the early 1940's.

Iran is developing its nuclear capability both for electricity and possibly a weapons capability to counter any threat of retaliatory threats from the US. Iran not supplying oil would push prices up further and only create further tension. Iran does not like selling oil in US Dollars and would prefer to sell in Euros as does other countries such as Venezuela. Iran is expected to open their Oil Bourse trading oil in Euros in Mid March 06. This is more a threat to the US and its interests than any weapons of mass destruction. The US economy is so in debt to the rest of the world that selling oil in Euros could see a switch out of US Dollars to Euros and less people would want to hold worthless US Treasury Bonds. The last person who sold oil in Euros was Saddam Hussein and we know what happened to that experiment. There is an excellent piece written by Krassimir Petrov "The Proposed Iranian Oil Bourse" www.energybulletin.net/print.php?id=12125

It explains the US Dollar is a currency that is backed by oil. All oil is traded in USD and people must hold USD to buy oil. As oil supply has increased over time so has the US money supply. The US is able to tax all holders of USD by issuing Treasury Bonds. Literally the US has forced the rest of the world to accept debt in return to fund its consumption. This all happened with Bretton Woods in 1945 and on 15 August 1971 when the US severed the link with the gold standard. Note this was the time that US oil production begun falling as the US production peaked and it begun importing oil at ever increasing rates that the US now consumes over 25% of the worlds oil production. A way had to be found to maintain its ever increasing addiction to oil. It also allowed the US money supply to grow as oil production as oil production has grown faster than gold production.

One only has to look at the increase in the gold price and the movement between the Euro from the US Dollar to realize many central banks are wanting to get out of ever depreciating US Dollars. The Oil Bourse would make a US Dollar collapse more likely to occur. On January 6th in The Financial Review John Hewson pointed out that "the foreign reserves of Asian countries was about $US2.5 trillion at the end of 2005 and these countries have suffered significant capital losses from the effective real depreciation of the US dollar by 12 percent since 2002. He then quotes that "only a fool would say that such portfolio shifts are unlikely. He then explains that this was the reason why the Asian financial crash occurred.

The IOB would help play a role in this occurring should it be successful. I suspect that there will be much effort to ensure that the Bourse does not trade. The rising oil price is only help exacerbate the US trade problems and foreigners having to accept US Dollars. Something has to give. Its debt is at unsustainable levels. A correction will have to occur. Otherwise interest rates in the US will have to rise to rates which will compensate bond holders for the risks of holding Treasury Bonds.

In the US House of Representatives on the 20th February 2006 the Hon Ron Paul a Republican of Texas gave a speech on the floor of the house, in which he derided US dollar hegemony arguing that it put the US at great risk. He was very concerned that the US and the debt associated with it is an accident waiting to happen. His speech was reasoned and well thought out. What he did not ask was how do you continue print more money to fund your consumption with the oil supply that backs your currency shrinking and still keep inflation under control?
www.house.gov/paul/congrec/congrec2006/cr021506.htm

One only has to look at how most wars in the past have happened, it has been over battle for resources. One hopes that this can be avoided. It would be totally futile to waste massive amounts of oil in a war for oil. One thing to remember is that with all major wars there have always been unintended consequences. WWI saw the Bolsheviks come to power in Russia and the fall of three major royal families in Europe. The Second World War also saw a number of royal dynasties quit the scene. It also saw the rise of communism in many parts of the world and the end of the Britain's empire. Would a war in the Middle East destabilize the House of Saud and/or the Al Sabah dynasties? Could this see the rise of a more militant Islamic regime in numerous Middle Eastern countries? Could we see the end of another great empire exhausted of its resources from fighting such a war? An war for oil would look to future generations as a futile waste of resources fighting to keep a way of life that was unsustainable. Neal Branvik's piece the Death of the Petro-Confederacy makes the parallel of the US today and its need for oil with slave owners in the south and its addiction to cheap slave labor. The ironic thing was oil and tractors would have seen the end of slavery, yet a war was fought regardless.
www.energybulletin.net/newswire.php?id=12680

China and Japan are also competing to access under sea drilling areas and it is this reason why tensions have risen between the two countries, not school books. Both countries need access to oil and gas for their continued growth. One hopes that they can resolve their needs for energy amicably. 97 % of Japan's oil comes from imported oil.

If we can get through this problem in a way that does not see us fighting wars then this will be a massive achievement by world leaders. This will mean that our leaders will need to begin transitioning us away from oil in a way that allows us all time to adapt and will ensure that there is less likelihood of getting to a position where war is inevitable. It has to be done in a way that ensures that the developing world gets to improve itself and the developed world accepts that it has enjoyed most of the petroleum resources and it is now time to share. We may well have to accept the Rimini Protocol as a way forward. One hopes that governments around the world take to this with more vigor than some have done with the Kyoto protocol.

Potential new Sources of Oil

Let's get one fact straight, oil is the result of both biology and geology coming together. It is a process that has taken over 100 million years to occur. Oil is held in source rocks that have the propensity to hold and trap oil. It occurs in only in selected areas on the planet. It is the result of small tiny organisms who, lived a millions of years ago in the sea whose outer wall were made of hydrocarbons and oil was formed by the heating of their remains.

As we have said before exploration peaked in the 1960's and ever since although we have some sophisticated tools discovery rates have fallen. We have spoken about the poor results of using all these new high tech equipment. It's not the equipment it is the lack of source rocks. There are areas which we could well drill if we are to keep up this addictive behavior to oil. They are as following;

The Polar region of Antarctica and Artic
Great Barrier Reef
Kazakhstan

These would be total waste of precious resources to leave these areas poisoned and in need of rehabilitation for many generations so we can keep our need for a short term fix. This is addictive behavior at its worst.

What is being talked about more and more is what is called unconventional oil. These are Deep-water oil and the Tar Sands. None of these are cheap to extract. We are relying on these more and more and thus the price of oil can no longer remain cheap as the cost of extraction is high. The energy return is lower than we have had previously as we have to put more energy and will get less of a return.

Tar Sands

Tar Sands are literally and oil reservoir still born. It never became what it should have been. It is not light sweet crude which flows easily but a mixture of bitumen and sand. Most of the volatiles have evaporated long ago and it's the heavy hydrocarbons that are left. It is what is referred to as unconventional oil. It mainly occurs in Alberta Canada and Orinoco in Venezuela. This is not sucked out with a straw but mined in an open cut method. It then has to be processed to strip out the sand and cook the bitumen to release the volatiles remaining. At this stage it requires enormous amounts of natural gas and water. From my reading of Prof Aleklett's testimony to the US Senate, Tar sands will not be a technology that will upscale very easily as compared to finding a new super giant field.

There are already problems with US natural gas production declining and Canada having to export more gas to the US. The question is will it get to the point where Canadian's have to choose keep itself and the US warm or make oil from tar sands? I suspect that with Natural gas prices being so high many of these projects may well not be as profitable as one had first imagined. There are even proposals to build nuclear plants to generate steam and electricity to help process the tar sands. While some may proclaim this as the savior to oil it is only a further sign of an addict looking for a new type of fix. The same can be said for oil shale.

Both of these technologies do not have the Energy return on Energy Invested that high quality conventional oil has. Both have serious environmental issues and also are greenhouse gas unfriendly. It is due to the fact you are putting more energy in to get less out. None of these are cheap either. Unconventional oil requires high oil prices due to the higher costs of extraction and processing. This means consumers and the economy will not receive the same economic benefits as they have with cheap high quality conventional oil. It's halfway between a coal economy and a late 20th Century oil economy.

Conservation

The area where I can only see as a source of oil is what is called "nega barrels" Simply put its conservation and resource productivity. We squeeze more value out of what we have. We take a good hard look at ourselves in the mirror admit we have a problem and resolve to break the oil addiction and take action to break its addiction before it is too late. We can develop a society that does not need copious amounts of oil from unstable areas of the world and whose resource base is in terminal decline.

Options for reducing Australia's Transport fuel demands- Mitigating actions

The IEA's suggestion of saving in oil in a hurry deserve, these include changes to the working week, more carpooling, working from home using high speed telecommunications, reducing speed limits on highways and roads. These are just some of their recommendations. I urge your committee to read this report. I have seen discussions on web logs about it. From what I have read none of these seem impossible to do. Whether we realize too late is the problem that concerns me. It will be a case of business no longer as usual. Dick Cheney said that the "American way of life is not negotiable. In response to it James Howard Kuntsler said" mother nature will renegotiate it for us." My point is we in fact may be forced into them not by choice but necessity.

Other Actions that need to occur

In the mitigating actions there are no silver bullets, just many little bullets. Not all of them make massive changes. It is the combined effect of then all that will make a difference. Not that it will be easy or that there will not be pain. We need to think outside the circle. We cannot look for big solutions to solve the problem. They do not exist. A new way of thinking is required. This is the 21st Century and 20th Century answers will not necessarily solve the problem.

One of the areas where oil can be saved is the area of long distance transportation. The need to get more trucks off long the highways and onto rail should be the goal. Trains and ships are more efficient than trucks when moving goods long distance Investment in rail is a long term project and some of the budget surpluses from high commodity prices and positive economic growth need to be invested in these projects. Upgrading the rail network to allow goods to be shipped faster between capital cities is essential. I am no rail expert but have read that some parts of the Sydney to Melbourne and the Sydney to Brisbane tracks are in urgent need for improvement in track and signaling. If we can be cut the time taken to ship goods by rail, then there is more of a chance that rail and compete against long distance trucks. More needs to be

done to get freight onto rail and for road transport to pay for the true costs of the damage it does to roads, the environment and the community in general. Later on this line may one day need to be electrified. This is especially true if oil supply decreases and becomes problematic.

If we can cut congestion by getting trucks off the road cars will idle less and use less oil to travel the same distance. Congestion of roads is an unproductive use of oil. Idling and stationery cars only achievement is oil use and pollution.

Tax Congestion and Oil consumption not income and employment

We really need to tax congestion rather than employment and income. We probably need to tax oil consumption more but at the same time reduce overall income tax and increase welfare benefits. This, maybe by way of increasing the tax free threshold and welfare benefits and index it to the increase in petrol excise for example. . We may also want to abolish payroll tax or at least reduce it.

We need also to be able to easily load containers on and off ships and onto or off trains where possible. All ports need to have good rail access and we should look to upgrade our ports where required. This may get trucks off city roads, which is essential for reducing congestion. The question is our rail system up to taking more traffic?

Some goods will need to be shipped by sea especially heavy low value commodities. Trucks and trains will not be an option. There was a time when coastal shipping played a bigger role than it does today. Ships are the most fuel efficient way of shipping bulk goods. We don't normally airfreight wheat and sugar, except in times of famine.

Elimination of GST on Public Transport

The elimination of the GST on public transport although not large in scale would certainly tip the balance towards mass transportation systems. It may in fact encourage more people to use it on weekends where congestion on our roads appears to be a growing trend. There are now parts of Sydney that it is easier to take public transport than to battle traffic and battle for a car parking space.

Improvements to public transport

There will certainly a need for more regular and faster public transport. Public transport needs to be clean and reliable. Non Air conditioned and unreliable trains and buses cannot compete with private air conditioned motor vehicles. This is normally a state government responsibility however they would need to realize very urgently the task facing the community as a whole and take action accordingly. This again would give people an incentive to use it to get to work, go to the city etc. We need to start beginning to save oil now. It will take time to get people onto public transport and begin changing people's attitudes before it is too late.

We need to begin thinking that increased transport services are not a cost but part of social wage that is paid. Areas say in Sydney's North Shore have public buses, trains

and good roads and the people have high income levels as well. Other areas have poor transport and low wages and thus less opportunity. These areas have little chance of improvement in a post peak environment with higher prices for oil and thus governments will need to think long and hard about locking some citizens into poverty and others into a position of entrenched wealth.

Removal of subsidies given to the road network and cars over public transport and rail

All government policies that subsidize private cars and trucks over rail and public transport need to be looked at. They policies need to be eliminated as they are giving incorrect market signals to consumers. Consumers need to get a very loud message both politically and economically before it is too late.

We subsidize a car industry that makes cars that are not fuel efficient. We drive on roads that motorists do not pay directly for their upkeep. We pay flat rate tolls on roads whether they are congested or not.

The air quality in capital cities especially in Sydney results in people being a drain on the health system. Roads that are clogged with cars act as a drag on economic growth as well as economic wellbeing. It's not just about quantity of growth but quality of economic growth. Kids have asthma and older folks suffer from breathing difficulties etc. Our cities throughout the year have a brown haze across them. Yet despite this we still seem oblivious to the fact we have a problem with oil.

We expect public transport to pay its way but roads not to. It is pick and choose economic rationalism. This certainly looks to me as if the rationalists are cheer squad of trendy issues than serious players in the debate. If you do not include health and social costs that are paid every day by the community then you are getting the wrong answers. This is because it does not give the economists the answers that their clients want. They are selling us all short.

Establishment of car pools and Car sharing

Car pooling represents one quick and cost effective way to lessen the cost of increase in oil prices. Car sharing would be another way in which communities could pool resources and not need to take larger cars to do errands and shopping. Car pooling and car sharing is more able to work with computer software and mobile phones than it has before. Examples are the ride share proposal of the Community Solution group. I have enclosed details of it. www.communitysolution.org This group spent much time studying Cuba which went through an oil crisis when supplies of cheap oil from USSR dried up with the fall of Communism.

Redesign of suburbs to reduce dependence on oil

Part of Australia's current obesity epidemic is caused by suburbs which are dependent on cars to get around. Health officials are already warning of the future cost of obesity on an ageing population. If we redesigned suburbs with more bike and walking pathways, we would get a double saving. Reduce costs on the health system as well as

reduce the impact of oil on the balance of payments and reduce the inflation effects and lessen the effect of reduced purchasing power on individuals and communities. This would then free up more cash available to counter the effects of peak oil.

Re-Introduction of Light rail and expansion of heavy rail into suburban areas

In Sydney in the 1950-60's the tram network was systematically dismantled. This had served Sydney well as a means of moving large numbers of people. When peak oil occurs this decision will look delusional to advantage private motor vehicle use to future generations. Upon reading a 1934 Gregory's Street Directory of Sydney recently, I was amazed at how extensive the tram network was and how integrated it was to the harbour and the ferry system. Given what I now see its retention may have mitigated some of the problems the city currently faces and may well have helped deal with some of the current problems of traffic and pollution. The need to rebuild the light rail and systems will be extremely important. This alone would do much to ameliorate the effects of oil use in the city. It would reduce congestion and reduce air pollution as well. This would certainly make suburbs more livable. Light rail can also be used to carry goods. We may well need to use it rather than diesel burning trucks.

A photo of a cargo tram is below shifting parts to the Volkswagen factory in Germany. (Source Wikipedia) This shows that light rail can not only move people but goods as well.

This goes for heavy rail as well. Heavy rail can transport larger amounts of passengers and goods and in parts of Sydney it could well allow for consolidation of the city and reduce road congestion which is a major contributor to both pollution and excess use of oil. However both light and heavy rail takes time to build. The question is how much time do we have?

It would also revive manufacturing and construction which may be affected by peak oil and its effects and provide jobs at a time of rising unemployment. With the possible closure of one of the car plants a pool of skilled labor would exist to build

trains, more buses and light rail cars. It is something that governments need to seriously look at. I cannot stress this enough. The time of governments being like ostriches is quickly coming to an end.

These actions will do much to prevent the suburban sprawl but at the same time improve the quality of many of our suburbs already overrun by cars and trucks.

Introduction of trolley buses or CNG buses

If more railways are out of the question in some areas then another option may be to go for trolley buses running on electricity or buses running on compressed natural gas. These would allow for passengers to be transported easily without resorting to oil. They can be articulated and this would allow for more passengers to be carried. Sydney is already beginning to build bus-ways in Western Sydney these could well be electrified in the future.

An example of this is in Arnhem in the Netherlands below (Source Wikipedia) Trolley buses were used in Australia before. If required they could be brought back if required. There is no need to lay rail tracks is an advantage as well as cost that they have over light rail. However they cannot move as many people as light rail.

This is technology that exists today. It does not need to be researched and can be deployed relatively quickly.

Hybrids and Plug-in hybrids

The main advantage of hybrids over conventional petrol and diesel is that they reduce consumption by switching off the engine while idling. They charge the batteries by breaking and use the electric engine to take. The main example of this is the Toyota Prius. Plug- in hybrids does not yet exist in commercial models but the batteries can be recharged at night allowing for more driving on electricity. With this technology it will take many years to get them into more cars and as Australians hold onto their cars for a long time it would take many years to have sufficient numbers of these cars to be in sufficient numbers to reduce oil consumption. Please note the similar comments noted in the Hirsh report for the US.

High Efficiency diesels

In Europe high efficiency diesel cars are very common. The Turbo Diesel Golf is just one example. As mentioned previously there are no locally made diesel cars made by Ford or Holden. Note also my comments about fleet replacement above for Hybrids. It takes a lot of time and money to replace the whole fleet with more efficient vehicles. This was certainly one of the main conclusions of the Hirsh report. There is talk that Holden may bring out the new Commodore in a diesel option. Whether this happens remains to be seen.

Redesign of products

All products whether they be, electronics, cars, trains or planes will need to be redesigned to use less energy. This will be very important once we get into higher energy costs. All energy saved means that any spare energy is available to be used more efficiently elsewhere.

Relocalization and the growing food closer to cities

One thing that peak oil could well do is make us grow fruit and vegetables closer to the markets that they serve. We may even find we go to eating more seasonal foods and areas adopting a more regional cuisine. That is eating foods gown more locally. Ie people would eat tropical fruits in NT rather than in Tasmania. Tasmanians would more cold tolerant fruits and vegetables rather than more expensive tropical fruits.

There could well be more people being employed into agricultural and horticultural activities.

Need for new Education

There is always much debate in this country about what we teach our children. It is a perennial argument as times are always changing. However it will certainly be very productive for students to learn skills such as gardening, permaculture, composting, bicycle repairs as well as IT. We may need to go back to teaching basic sewing, shoe repairs, woodworking skills. This is in no way a comprehensive list but merely to illustrate my point.

It is not just for the children but for the adults. The community colleges may need to get away from what I call useless crafts like scrapbook making to more practical crafts like discussed. The schools and colleges will need to be part of the hub of our communities as well as libraries. The most adaptable people have the best information available to them. They also have a passion and a commitment to education to better themselves, their families and their communities.

Teachers may again live and work in the same suburbs and towns. When I went to school there was a house for the headmaster to live in. These are a thing of the past but may well come back again. They may in fact live so close that they can walk to school. Saving them money and time as well as getting exercise and talk to students on the way also to school. Something lost in the age of the automobile.

The Internet and Telecommunications

These two technologies allow us to communicate over long distances and I feel are the most important for our transition tool. The internet allows us all to share information, communicate. Books do not have to be shipped all over the world they can now be down loaded and read on home computers laptops and PDA's. Most information that I have collected for this presentation came from the internet. It also allows people in far away places to collaborate on peak oil and thus pool intellectual capital. This includes interviews and programs on radio and television as well as newspapers that I could never have found using the current level of media in this country. The internet allows for conferences to be seen without stepping onto a plane as well as contribute to web logs on a variety of subjects and issues.

Even buying groceries may change. We have home shopping these days and it could well increase. When my grandmother was a small girl her mother would phone the store and the shop would deliver it by horse and cart and then later by truck. People made sure they had plenty of bulk goods such as flour, sugar, tea etc. Deliveries would occur on a certain days. The same happened with the Milk man and the bread deliveries. This was a time of less oil and we could well be there again once when we begin falling down Hubbert's peak. The only difference is that the internet will allow people to do the purchasing rather than needing to drive to the store. Catalogues can be down loaded off the net and clothes can be sent by post. Again this is a case of what my great grandmother did at the turn of the 20th Century but with technological enhancements.

The Media

Many in the media both left and right are stuck a time warp and trendy ideologies that suit them. One only has to read the papers in this country for two weeks to hear the same drivel recycled. Hardly anyone except for two, have written articles about peak oil. It's a case of don't mention it. One only has to look at President's Bush's admission in his state of the Union speech where he admitted "America is addicted to oil" He was honest. Did our fearless journalists look at themselves and ask the question. Is Australia any different? As I said before this report was complied mostly by media overseas or on the internet. It says a lot about quality of our esteemed media. Waiting for the media and public opinion to get on board may well be too late.

Community Consultation

The need for governments of all persuasions to begin talking about peak oil is important. The last thing we want is to spawn Australian versions of the British National Party who seem to sniff an opportunity to get back into the game. These people turned up at a peak oil conference in Scotland. They sat and listened and like jackals sniffing an opportunity. This came as a shock to many in the peak oil community, as it no longer was seen as a case of being a scientific and engineering problem to overcome. Most in the peak oil community are either conservative or green not ugly. We study peak oil because we worry what will happen to our children and our grandchildren. We want a nice world not an ugly one.

We need to begin talking about these issues not in an alarmist way but in a way that people begin to see the problem and effects ahead. I am optimistic that it can be done. 1 September 2005 Prime Minister Dominique de Villepin said “We have entered the post-oil era” He went on “I want to draw all the consequences of this and give a real impulse to energy savings and to the use of renewable energies”. Are the French people more superior to us that they can understand this and we cannot?

Congressman Roscoe Bartlett has spoken in the Congress with his speeches. He has even briefed the president on this. His discussion was off the record, but one wonders if Bartlett and Matt Simmons have won over the president. Andrew McNamara in Hervey Bay is talking about it as are other politicians. I am very much appreciative and supportive of this work.

We need to hear the message from all sides of politics that the end of “Cheap oil is over and we need to adjust” At the moment there is little proper discourse on this whole topic. Once people know about it they can make up their own minds. They need the facts not waffle from our leaders. I suspect it has a lot to do with us trying to copy what goes on in mainstream US politics. It seems to be a cheap trashy copy of a system going nowhere on real issues. We need more. It is possible to have the debate so let’s bring it on. This enquiry is a good start. Let’s keep going.
We need more of our leaders talking with their constituents about this problem. There are many clever people in our community and we need to begin harnessing their thoughts and ideas on this idea. Debating whether it will occur is a time wasting exercise and takes us away from the main game of transitioning. We have to accept that it will occur and move on. Otherwise we are still in denial.

Energy Options

I foresee that there will be major changes in the energy sector driven by the effects of peak oil and gas. There will certainly need to be a change in how energy and resources are used. I certainly see foresee people traveling less. They will certainly need electricity for homes and home based businesses. Rail, light rail and trolley buses all need electricity to move people around. Long distance transportation cannot rely on electricity so this will be the problem.

Nuclear

I have personally believed nuclear was one energy source we did not need in Australia. However, since reading about Greenhouse and peak oil, I cannot see how we cannot rule it out without doing some serious research into it. We may need to use coal for making liquid fuel or even powering transport. We certainly cannot power an expanded rail, light rail and or trolley bus system without expanding electricity generation. How are we going to do that?

The waste has still not been properly addressed and stopping nuclear weapon proliferation is definitely a problem. Ensuring Plutonium does not end up in the hands of terrorists is a problem. I do not think it is a case of wind and solar versus nuclear. We may in fact we may need all. The Nuclear draw card is that large plants can be built for power generation it up scales well. However a Nuclear plant takes many

years to build and we may not have the luxury of time or of money to build. We may have missed the nuclear boat entirely. This maybe a good thing.

M King Hubbert in the last years of his life advocated the use of Breeder reactors and he may be right. Although this is not a solution that many green groups would certainly want to entertain. It is certainly not without its risks and dangers. There are many technical and security issues which still need sorting out. Whether they can be sorted out to a level that is satisfactory remains to be seen.

Solar

Solar in Australia does have an important part to play it is good for heating and in electricity generation. Solar hot water needs to play more of a role in this country and this would lessen the need for both Natural gas and electricity from coal. Again this would free up other energy sources to partially replace oil. The phasing out of electric water heaters with solar water heaters would reduce the need for burning as much coal or at least allow for the energy saved to be used for transportation.

Photovoltaic cells for electricity generation in rural and remote locations is certainly important and its use should be expanded as previously mentioned, especially where diesel fuel is currently being used to generate electricity. It could even one day be used in urban settings where people have less energy thirsty electrical equipment.

Solar does not have nasty side effects like nuclear, it can generate local jobs, would encourage R&D. The price would need to fall to make it more attractive. When push comes to shove, who knows what will happen. It is a resource we have in abundance. We need to see it more as mainstream solution rather than on the periphery.

With energy efficient appliances and better designed homes solar is able to help make some difference to people's lives. It does not have a half life waste problem. It can be implemented quickly but does not upscale well. But I am yet to hear about a dirty bomb made from solar cells.

Australia is a very sunny place and is naturally suited for solar. The question is why do we not use more of it?

Wind

I foresee more wind energy also as a growth industry. It is easier and quicker to build new generating capacity by wind than nuclear. It is clean although some residents may complain about the noise and the visual attraction of them. Wind is a good clean technology and need to be expanded where possible. Rural and remote communities should be encouraged to develop these forms of power as they provide jobs as well as energy for the local community. Certainly many coastal communities could use wind rather than large and expensive transmission lines from power plants far away. Jobs created by wind give rise to more skilled trades-people in rural areas and this assists in making the community more sustainable.

The question is how much wind power can be used to meet electricity demands. Certainly there appears to be more available

Wind generates no toxic emissions and that more of the electricity for the residential sector will need to come from the renewable energy sources. It may free up the coal and natural gas resources for more important uses. This means for making liquid fuels, high value plastics and chemicals as well as fertilizers.

Bring Back Sailing Ships?

It is also possible to design container ships than can use a kite used in advanced ocean racing yachts which is, computer controlled. The ship still runs on fuel oil but it lessens the use of oil. The Captain can reduce how speed of the ship's engines. It is literally a hybrid ship. A few percent increase in energy efficiency over long distances and high usage adds up to very significant savings. These may well take time to come into effect but it can be done.

Wave energy

Being the world's largest island continent we are reminded that it is "girt by sea" The question needs to be asked how do, we begin using some of the energy that slams against our island home on a daily basis? We have created many surfing champions that have harnessed the power of waves to win world championships. Why can't our engineers harness this energy for electricity generation? Hopefully something constructive may come out of research. Only time will tell.

It is an area that we certainly do need to take a good hard look at.

Coal

In Zimbabwe the government has made the decision to use some of its old steam locomotives due to the high price of importing oil and its abundance of coal. This was also due to the high cost of diesel parts and the worthless value of the Zimbabwe Dollar. Many in the Peak oil community regard Zimbabwe as the first victim of peak oil. Whether it is or is not remains to be seen. It certainly shows that a different way of thinking is required. Not always good. Coal again is one resource Australia has in abundance. It can be converted to either Gas or can be turned into a liquid fuel. Unfortunately whenever you covert coal to either gas or liquids you lose energy in the process. We will loose energy into our economic system with oil decline so the question has to be asked do we need to invest more energy to get a lesser return?

It is definitely not greenhouse friendly and I do not expect to see the CO2 being sequestered in any time soon. Apart from a few demonstration plants it won't happen. It's too expensive and is really only a smokescreen to keep coal in the game. Mind you we may need Coal. Certainly the world's poles do not need more coal to be burned.

South Africa when under sanctions converted coal to oil as did Germany in WW2. The technology exists. Note South Africa also used Steam trains for longer than other countries did as it had coal and no oil. It also had plenty of unemployed which it could harness to run a steam powered railway. If trains were redesigned to run on coal more

of a fine powder or slurry than big black lumps it would probably be more efficient than the old days and could well be used for ships and trains.

There was a time in Australia up to the 1970's when gas was made from coal using the coke and water method. This was before we began using natural gas. It's still possible. If Natural gas production begins declining we may well go back to the past. Unfortunately the good old days were not that good and maybe better to leave them in the past.

Energy Efficiency

What I could see as being more realistic to the problem is saving energy. Conservation means being truly conservative. It means accepting that resources are not unlimited and accepting the fact that economics is the study of how to allocate unlimited wants against scarce resources. There is no such thing as free lunch and resources are not unlimited. Many economists seem to have forgotten what economics is really all about.

Some of this maybe forced on us whether we like it or not. An example of this is smaller cars or motor scooters due to the high price of fuel.

Another is selling the car and using public transport and bikes instead. This is not a pipe dream, but an emerging reality we need to accept rather than a continual denial of a problem. The more we deny the problem the more we will find the change harder.

Using energy more conservatively and more efficiently enables us to gain more with less. Higher energy prices and increasing scarcity may well encourage development of more efficient transportation and equipment as well as conservation. This way we will develop our intellectual capital. It does not involve wearing a hair shirt and going cold, as some may suggest. Saving energy is about working smarter and being more productive with resources that we have. With rising energy costs it makes economic sense. The time taken to repay such savings on energy saving projects will only get shorter. The savings will also get larger.

Smaller, lighter and more fuel efficient cars is just one example.
More efficient power stations and energy transmission systems
Better designed houses and buildings
More light rail and heavy rail
More cycle- ways
Less toll-ways
Better designed suburbs and communities that are more enjoyable to live in and make people feel safe.
Less suburban sprawl

If we change our thinking we can make huge changes. It is possible.

Remember the cars of the 1960's as compared to today?

This is achievable. It requires thought and ingenuity!

Towards a Better society

If we are to try and keep a society together with a loss of a major energy source then we are going to need to do more with less and develop other sources to offset the loss of energy from oil and probably gas. Renewable energy will help us but will not replace everything we will loose with decline in oil and gas production.

We should not see that we need to hold onto everything what we currently have. We may well need to jettison some of the junk in our lives and focus more on the more important issues that really affect us. We can have a society less materialistic than we have now, but it does not mean that we have to starve. An example is Cuba it has a lower economic standard of living than the USA but has comparable if not better life expectancy rates. I am not advocating relocation to Cuba or Castro styled communism. My point is if Cuba can transition to a lesser energy intensive society why can't we?

We may find that many activities in our daily life are superfluous to what actually makes us healthy and happy. Why is it with such high standards of living we are so unhappy that, we binge-eat ourselves to obesity and premature death and sickness?

We have to recognize that the once in a billion year hydrocarbon party is beginning its decline. While the party is not yet over we have time to leave it before we end up disgracing ourselves. We do not want to wake up after the party's over and say to ourselves we did things that we should not have done.

Do we accept that we have a problem with oil and take steps to remedy this? Or do we shed young Australians lives to secure the last drops only to find out later we have used our last drops and we have wasted our youth?
Do we continue building toll-ways so we can keep a lifestyle that is becoming unsustainable or do we build railways and cycle-ways which we can sustain with resources that we have?
Do we send more of our military into increasingly more dangerous situations so we can have the privilege of sitting in our cars while stuck in a traffic jam and listen to the radio? Whereas we could have listened to the radio while on an air conditioned train and been moving.
Do we continue to support a car industry so have our middle class executives can drive a 6 cylinder car while other people feel stranded by a lack of decent public transport?
Do we continue to live in denial that cars cause pollution?
Do we commit future generations of kids to asthma so we can admire a brown haze across our cities and wonder why our kids are sick?

The choice is ours.

We can build a better society that his less hydrocarbon intensive that does not mean that we cannot still enjoy a great quality of life. What we want to avoid is a society that resembles New Orleans after the hurricane, where people began fighting and stealing do to the lack of resources. There are plenty of examples of that in the world.

We have a choice and it's up to us.

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