People for Ecologically Sustainable Transport

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The conflation of peak oil, climate change and a deep recession make the EES modelling for the Frankston Bypass obsolete

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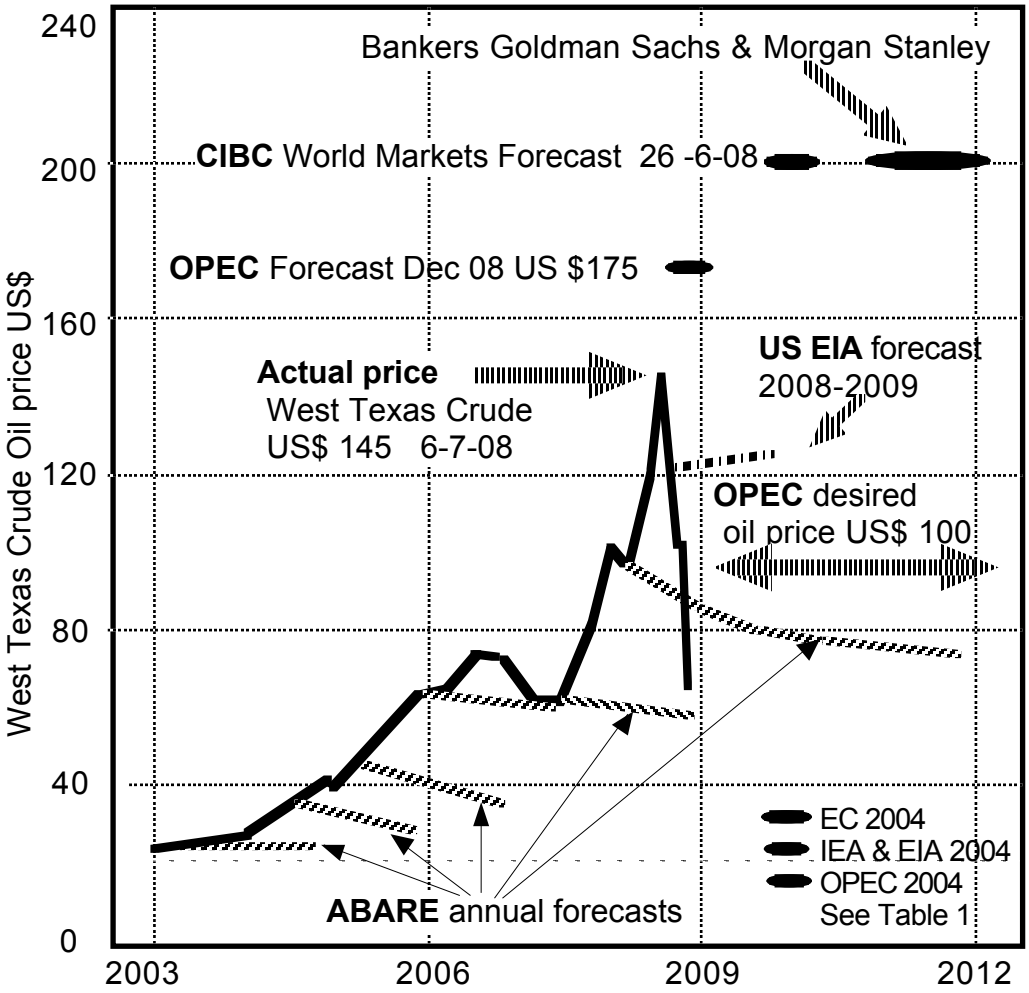
Figure 1. ABARE's recent oil price forecasts reflect the 2004 forecasts of the IEA , US EIA and OPEC for 2010 and failure to model the consequences of a deep recession till 2012



PEST Submission on the Frankston bypass EES

1. Introduction

The reserve for a Frankston Bypass has existed in municipal planning schemes since the 1960s. In 2007 the State Government requested that SEITA conduct an EES that focused on a corridor extending from the Mornington Peninsula Freeway and EastLink interchange in Carrum Downs to the Mornington Peninsula Freeway at Mount Martha, a distance of around 25 km. The primary objective of a Frankston Bypass was to achieve a continuous and balanced road network, with sufficient capacity in the Frankston-Mornington Peninsula corridor to meet future travel demands till 2030. The EES was completed in September 2008 and released fo public comment in November 2008.

The EES fails to address the issue of oil depletion. Most of the EES was written before the price of West Texas crude peaked at US$147 a barrel in July 2008.(see figure 1) The EES was released for comment a few days before the International Energy Agency report "World energy Outlook 2008" which forecast that world oil production peaking in the next few years and the need to reduce oil dependence in all countries. It warned that the assumptions about increasing economic growth and oil usage (used both here and abroad in past transport studies and in the EES) if continued would lead to a catastrophic increase in global temperature of 6 ˚c.

For the first time, the IEA included in its analysis a study of the depletion rates of the world's top 800 oil fields. The opening paragraph was blunt and spelled out an inconvenient truth ignored in the EES:

> *The world's energy system is at a crossroads. Current global trends in energy supply and consumption are patently unsustainable - environmentally, economically, socially. But that can - and must - be altered;* there's still time to change the road we're on. *It is not an exaggeration to claim that the future of human prosperity depends on how successfully we tackle the two central energy challenges facing us today: securing the supply of reliable and affordable energy; and effecting a rapid transformation to a low-carbon, efficient and environmentally benign system of energy supply. What is needed is nothing short of an energy revolution.*

Another problem with the EES is that it fails to take into account the most likely impact of the worsening international recession on the Australian environment, the economy and the car industry. The modelling of future transport trends fails to take into account the increase in fuel prices and possible oil shortages that will greatly increase the demand for public transport and reduce car traffic in Melbourne, including the EES area, till 2030.

The cause of the worsening international recession was predicted by Warren Buffet in 2003 who stated in his annual letter to share holders:-

"Derivatives are financial weapons of mass destruction.....derivatives are accidents waiting to happen.....Central banks and governments have so far found no effective way to control , or even monitor ... these derivative contracts... time bombs for the parties that deal in them and for the economic system".

In February 2008 the Book" The Trillion dollar Meltdown" (Morris 2008) was published which described in detail all the 'dodgy' financial engineering schemes that had been created as a result of 20 years of financial deregulation and predicted that the world's stock markets would crash in 2008. The EES ignores the inconvenient truth that the financial crisis is likely to last to at least the end of 2009 and is likely to damage the real economy for years to come.

The ratio of private debt to GDP is now more than double the levels that triggered the Great Depression. Australia's current level of private debt is now 165 percent of GDP. when in 1929 the ratio was 80%. Therefore the worst case scenario is far from being impossible. Indeed, it took 3 years for the All Ordinaries index to reach bottom in the Great Depression and if it dropped that much in the near future it would reach bottom in September 2009; it would then take another 4 years to return to the 120 year average growth trend line in September 2014.(Bassanese 2008)

If the All Ordinaries or ASX 200 index dropped to the same level as the All Ordinaries did in 1932 it would be around 1,100 and the unemployment rate would be round 28%. Note that the ASX200 had a closing peak of 6,829 on the 1st November 2007 and exactly one year later it had dropped 55%. By October 29 2008 stocks dropped in all the major countries: All of them are still going down; what is unknown is how long it will take to get back up. If it takes four years to get back up it will make the EES assumptions about people and car population increases in the area irrelevant.

The EES fails to model the worst case scenario of future transport trends in a low or no growth economic environment. It fails to take into account the potential demand for mopeds, scooters, electric bicycles and public transport vehicles in all the major cities in Australia out to 2020. It fails to acknowledge that the growth of toxic debt is a threat to the survival of both the world and to the Australian economy and car industry. Like nearly all the other transport strategies and freeway studies it is obsolete and irrelevant. Like most of the transport plans produced in the last ten years in Victoria it needs to be rewritten taking into account the inconvenient truths of climate change, oil depletion and financial instability in the real world..

There is a need to cope with the negative synergies of climate change, peak oil and an unstable world financial system that threaten our well being . There are more than 14 million registered vehicles on Australian roads; increasing car ownership owes its growth to energy derived from crude oil and is almost entirely dependent on it. There is no silver bullet to reduce our addiction to imported crude oil – instead we need a package of measures to reduce per capita oil use in an equitable way to cope with the inevitable longer term oil shortages, increased unemployment and the collapse of many companies.

There will be no shortages of road space for cars because there will be no fuel to make them, fuel them, or maintain them. There will be lots of room for a mix of buses and shared cars and to have space left over for the provision of bike lanes. Because of the necessity of relying far more on public transportation and walking and cycling the population projections for the EES area are far too high.

2. The poor fuel efficiency of Australian made cars

The most important measure to increase the long term viability of Australia's car industry would be to make fewer cars that are fuel efficient. That is not happening (See Table 1 below).

Table 1 Vehicles sold in Australia with lower emissions only

MODEL	FUEL	CO2 EMISSIONS (G/KM)
Volkswagen BlueMotion Polo (not sold)		**99**
Peugeot and Citroen planned for 2011		100
Toyota Prius	petrol/electric	106
Toyota Prius I Tech	petrol/electric	106
Honda Civic Hybrid	petrol/electric	109
Audi A3 1.9e TDI Sportback Manual	diesel	119
Hyundai i30 1.6 Diesel Manual	diesel	125
Peugeot 308 XS HDi Manual	diesel	130
Peugeot 207 Touring XT HDi Manual	diesel	131
Mitsubishi Colt ES CVT	petrol	134
Skoda Roomster 1.9 TDI/77kW Manual	diesel	145
Skoda Octavia Elegance Wagon 2.0 TDI/103kW Manual	diesel	150
Renault Megane Sedan 6-Spd Manual	diesel	154
Audi A4 2.0 TDI Multitronic (Automatic)	diesel	154
Holden Astra CDTi Hatch	diesel	159
Hyundai i30 1.6 Diesel Auto	diesel	159
European Car fleet average		**161**
Skoda Octavia Ambiente Sedan 1.9 TDI/77kW Manual	diesel	162
Honda Civic VTiL Sedan	petrol	164
Volkswagen Golf 2.0 TDI Auto	diesel	165
Volkswagen Jetta 2.0 TDI Auto	diesel	168
Volkswagen Passat 2.0 TDI Auto	diesel	178
Saab 9-3 Vector 1.9TiD Sedan	diesel	181
Saab 9-3 Vector 1.9TiD Combi	diesel	181
Lexus GS 450h	petrol/electric	186
Audi TT Roadster 2.0 TFSI S-tronic (Automatic)	petrol	188
Peugeot 407 STHDi Automatic	diesel	189
Lexus RX 400h	petrol/electric	192
Mitsubishi Lancer ES CVT	petrol	196
Holden Captiva SX	diesel	198
Honda Accord Vti	petrol	209
Hyundai Santa Fe 2.2 Diesel Autodiesel		218
Lexus LS 600hL	petrol/electric	219
Honda Odyssey Luxury	petrol	222
Australian car fleet Average		**231**

The EES predicts that there will continue to be strong demand growth in all areas of road transportation into the foreseeable future and assumes an annual growth rate of 2.5% a year which at the present time is a totally unreal expectation. This in turn is expected to lead to ongoing growth in CO2 emissions within the road transport sector. In 2008 the greenhouse emissions per car sold in Australia were almost 50% higher than those sold in Europe — an average 231 grams of carbon dioxide a kilometre compared with 161 grams.

Worst of all, the EES reflects an oil addict's state of mind induced by gross dependence on oil which is best described by James Howard Kunstler:

> *We are now hobbled by a tragic psychology of previous investment – that is, having poured so much of our late - 20th century wealth into this living arrangement – this Happy Motoring utopia – we can't imagine letting go of it, or substantially reforming it.*

Exporting large cars to the Middle East is just a means of transferring carbon intensive and fuel wasting products into another country's back yard. Many of these countries are politically unstable and will break up when their oil production peaks or the current financial crisis catches up with them. Australians making fuel efficient cars for Australians is the key to the car industry's long term survival. Making hundreds of thousands of large cars is an unsustainable practice that needs to be phased out without destroying the car industry in the process. Australia needs more fuel efficient cars and far fewer cars; cars will be available for use only for essential purposes. If that happens the Frankston Bypass will not be required.

More than half the new cars bought last year were part of government or business fleets. Despite dire climate change warnings made in the last decade only 13% of these PMV's were rated as low-emission vehicles. None of the low-emitters were Australian made; there are no locally produced vehicles meeting environmentally friendly criteria. Sadly, energy wasteful Australian cars produced this year will still be on the roads ten years from now or scrapped prematurely because they will become too costly to run.

3. Computer modelling ignored peak oil and the growth of toxic debts

There is a serious risk that high oil prices will eventuate within the next two years even if the current recession does not deepen into a depression. Any revision of *Vehicle Fuel Efficiency* should recognise that the key government agencies with a brief under the Westminster system *"to tell the truth to power "* did not know the truth, or withheld the truth, or considered the truth to be a *"known unknown"* during the last government's term of office. All the supporting state government transport and land use documents referred to by the EES are obsolete.

These documents were based on previous estimates of future oil prices prior to January 2008 which were way out and made no allowance at all for the impact of

an economic recession or depression. (See Table 1) Much higher growth rates and a stable economy were assumed, based on the unstated assumption that the business cycle of boom and depression had been abolished.

However when the economic tide went out in 2008 the key players were found to be swimming naked. Whatever the reason for bad advice it would be prudent now to take a risk management approach to both climate change, peak oil. and toxic debt (Hirsch et al 2005).

There is a history of t Commonwealth and international energy bungling and bad advice prior to 2008.

3.1 The unsound forecasts of ABARE

The Australian Bureau of Agricultural and Resource Economics (ABARE) is the Commonwealth agency with most responsibility for the failure of previous governments and consultants to anticipate and plan for the peak in world oil production; this peaking threatens the future economic well being of nearly all countries with escalating oil prices and the collapse of many industries dependent upon oil products and petrochemicals.

An ABARE spokesman on oil resources said at the 2007 Senate oil inquiry hearing that *"...when the price is high enough even the roosters will lay eggs".* His little joke suggests that he wanted to trivialise the threat to the national security of peak oil. Whatever the reason the preservation of a stable democracy depends on conserving oil for essential purposes and ABARE has failed to anticipate this threat. The inaccurate oil price forecasts of ABARE since 2000 are set out in figure 1; so how did they get it so wrong and why? The answer to that is given in the ASPO paper (Ward 2006) which stated in the conclusion that :-

> *"ABARE's prediction pattern is generally the same: the oil price will gently recede from its current value. this means that in situations where the actual oil price is trending upwards it ABARE forecasts will tend to undershoot, and the further the forecasts goes into the future, the greater the gap will be. In short ABARE can predict the price under conditions where the price remains stable, because under such conditions the price will remain roughly constant or gradually recede. Unfortunately, stability (or lack there of) in the oil market appears to have been totally unpredictable, which ultimately renders it unreliable.*

ABARE's forecasts for 2005 were that the price of oil (West Texas Intermediate) would be between US$30 and $35 a barrel (ABARE 2005). Figure 1 shows that they are still making these totally useless forecasts 3 years later in 2008. The Productivity Commission is even worse; it refuses to recognise that conventional oil is a finite resource. Sadly ABARE was not the only Australian government agency whose forecasts of falling oil prices have been consistently wrong for five years.

3.2 Unsound forecasts of the Bureau of Transport and Regional Economics

The Bureau of Transport and Regional Economics (BTRE) was the Commonwealth agency responsible for providing advice to the government, motoring organisations and state government agencies responsible for long term planning. In 2005 the BTRE did a review of the peak oil debate entitled "Is the world running out of oil: working paper 61" which shows that the BTRE was dependent on the forecasts of international energy agencies (See table 2).

The most powerful of these agencies was the International Energy Agency (IEA) which predicted that the price of oil in 2010 would be only US$22 a barrel, US$26 in 2020 and US$29 in 2030. These over optimistic forecasts were the reason IEA's previous recommendations for an "Australian Strategic Oil Reserve" were ignored by the Howard Government. An "Australian Strategic Oil Reserve" is needed.

The US Department of Energy Information Agency 2010 forecast was US$23 a barrel and US$25 in 2020. The Organisation of Petroleum Exporting Countries (OPEC), forecast only US$19 a barrel for 2010 and 2020.

The price of West Texas Crude was $US145 a barrel on the 16th July 2008., an event which was not anticipated at all by the BTRE which forecast that the price of oil in 2020 would be around $US 25 a barrel. These unsound forecasts were then used by many state government planners in the preparation of transport plans.

Table 2 Oil price forecasts for the period 2010, 2020 and 2030 (US $ per barrel)

Government or intergovernmental source	2010	2020	2030
International Energy Agency (IEA).	22	26	29
Energy Information Agency (EIA); US Department of Energy.	23	25	
European Commission (EC)	28	33	40
Organisation of Petroleum Exporting Countries (OPEC)	19	19	
Institute of Energy Economics Japan (IEEAJ)	24	27	
Centre for Global Energy Studies (GGES)	20	15	

Source: (BTRE 2005 working paper 61. p. 24).

Nobody realised that the data used in these BTRE , ABARE and IEA forecasts (before 2007) were mostly derived from the nationalised oil industries of dictatorial regimes. They trusted these national oil companies' data which grossly over estimated their oil reserves. Nationalised oil companies do not publish details about how much oil is extracted from each reservoir or what methods are used to extract that oil; nor do they permit external audits. (Economist 2006)(Simmons 2005) In 2007 the IEA began to use its influence to verify the data.

3.3 The IEA and OPEC have failed the oil importing and oil producing nations

Some energy agencies do learn from from their mistakes. For example, early in 2008 the IEA estimated the capacity of oil-producing nations to open new fields to keep up with growing demand over the next decade. It said that global production could not even make 100 million barrels a day because it was harder to keep supply and demand in equilibrium.

> *"When the price went up as a result of the Iranian revolution, demand went down,..... "But what has happened in the last few years has not been in line with economic theory. The price of oil went up sharply between 2004 and 2006 and demand actually increased. That may seem bizarre but it is the result of new buyers coming in, such as China and the Middle Eastern economies where fuel is subsidised by government and rises are not reflected on the consumer side." (Birol 2008)*

The Chief Economist at the IEA stated in March 2008 (The Independent, UK) that " the price of oil in 2030 will perhaps be US$150 a barrel," a mere US$21 more than the previous IEA estimate. Below he summarises the future problems faced by "Big oil" but still has an optimistic view of the price of oil in 2030.

> *We are on the brink of a new energy order. Over the next few decades, our reserves of oil will start to run out and it is imperative that governments in both producing and consuming nations prepare now for that time. We should not cling to crude down to the last drop – we should leave oil before it leaves us. That means new approaches must be found soon. Even now, we are seeing a shift in the balance of power away from publicly listed international oil companies. In areas such as the North Sea and the Gulf of Mexico, production is in decline. Mergers and acquisitions will allow "big oil" to replenish reserves for a while,and new technologies will let them stretch the lives of existing fields and dip into marginal and hard-to-reach pools. But this will not change the underlying problem. Oil production by public companies is reaching its peak. They will have to find new ways to conduct business.....What will all this mean for the price of petrol? The indications are that if the producers don't bring a lot of oil to the markets, we may see very high prices – perhaps oil at $150 a barrel by 2030. If the governments do not act quickly, the wheels may fall off even sooner. (Birol 2008)*

On June 10 2008 the US Department of Energy Information Agency(EIA) forecast for 2008 was US$112 a barrel and US$129 in 2009; it will be some time before they update these forecasts. The 2009 forecast is $106 more than their 2010 forecast in Table 1.(US EIA 2008)

When this estimate was published the sub-prime housing crisis and toxic debt problems were nearly a year old but no mention was made about these problems reducing the demand for oil via an economic recession which was officially recognised by President Bush in October 2008.

Note that the Organisation of Petroleum Exporting Countries (OPEC) represents many national oil companies Its members are: Algeria, Angola, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela. OPEC's members own 77 percent of the world's proven oil reserves, or a total of more than 900 billion barrels. They account for about a third of the world's oil production and over 40 percent of global petroleum exports. OPEC's forecast in Table 2 for year 2010 was very low at US $19 a barrel

In April 2008 an OPEC spokesperson said *"There is no shortage; speculators are responsible for running the price of oil up."* That seemed to be the daily mantra at OPEC. In June 2008 at a conference of oil producers and consumers they even predicted oil prices to reach as high as $170 a barrel that year (see Figure 1) However they were also concerned about the inflationary impact of high oil prices and said that oil at US$100 a barrel would suit them well and that current high oil prices must come down; also that importing countries should establish regulatory controls to limit speculation on the oil markets and invest more in refineries so that the heavier and sour oil could be used.

Saudi Arabia committed itself to a small increase in its production quota but that did not reduce the price. Toxic debt and the trillion dollar melt down did that. OPEC members blamed speculators but failed to realised the speculation had its roots in the fact that *"Derivatives are financial weapons of mass destruction"* that gave speculators a means of grossly leveraging their funds and turning stock markets into casinos.

3.4 Conserving oil to build the energy infrastructure required to replace oil

Because peak oil is certain to occur it would be prudent to conserve oil to maintain essential public services, maintain food production and construct the nuclear reactors, wind turbines and other renewable energy resources as envisaged by the IEA and the British Prime Minister at the June 2008 Conference of Oil Producers and Consumers.

Given the unreliable record of past forecasting and the contradictory views of the major stake holders in the oil business prudence dictates that enough of the good oil has be conserved by government to build the infrastructure needed to survive the end of the age of oil. National governments need to act together to exploit renewable energy sources and nuclear power. (Parker 2005A & 2007)

Increasing the price of conventional oil makes it more economic to extract and process tar sands, oil shale and coal to make refined oils. Unfortunately these non-conventional oils have a much lower energy return on energy invested and increase CO2 emissions 3 to 7 times. (Parker 2007) This is one of the reasons why, on the 12 th August 2008, the IEA Head Nobuo Tanaka stated that the only way that CO2 emissions will be reduced by 2050 and the demand for oil reduced by 27% will be by a huge increase in the use of nuclear and renewable energy

What Tanaka states below makes it clear that nuclear power stations will need to be built. This will require a change of direction in Canberra which has been presented with inaccurate oil forecasts by the IEA prior to 2007.

Der Spiegel interview with IEA head Nobuo Tanaka *12 Aug. 2008*

Extract from the interview about the current oil shock, the growing importance of nuclear power and the quantity of oil left in the world. (Bednarz and Jung 1980)

SPIEGEL: How does the current price shock differ from its precursors in the 1970s?

Tanaka: *In 1973, OPEC curtailed the oil supply for political reasons, and prices shot up as a result. Today, however, the strong global demand has triggered the crisis. It is a structural phenomenon that will only increase and will impose an ever-growing burden on the economy. We are not properly prepared for this. It is critical that we search for solutions.*

SPIEGEL: What could they look like?

Tanaka: *Basically, all we have to do is consistently pursue the CO2 reduction goals that the industrialised nations have agreed to. This doesn't just help the climate, but it is also good for energy security. In the IEA, we have developed a scenario on how CO2 emissions could be cut in half by the year 2050. This would reduce demand for oil by 27 percent. The most important instrument in this scenario is energy conservation. We must drastically improve efficiency. Add to this the increased use of alternative sources of energy, like solar, wind and hydroelectric. And we should also commit ourselves more heavily to nuclear power.*

SPIEGEL: What, specifically, are you proposing?

Tanaka: *Based on our calculations, to achieve the goal of cutting CO2 emissions in half by 2050, each year about 17,500 wind turbines would have to be erected world-wide, 55 coal and gas power plants would have to be outfitted with CO2 filtration and sequestration equipment and about 32 new nuclear power plants would have to be built. Currently one or two nuclear plants are being built each year. But there was a time when 30 reactors were placed into service every year. Why shouldn't we be able to do this today?*

SPIEGEL: Perhaps because the operators would run out of fuel?

Tanaka: *Our colleagues at the International Atomic Energy Agency (IAEA) in Vienna have assured us that this is not a problem, that we have enough uranium. In fact, where we have a shortage is with experts: engineers with knowledge in the field are in short supply.*

SPIEGEL: In Germany, many view nuclear energy with scepticism, partly for reasons of safety.

Tanaka: *I know that there is a debate on this issue in Germany. Our role is to provide data and analyses on opportunities and risks. Using this information, every country can make its own decisions.*

SPIEGEL: But your position in the discussion is obvious.

Tanaka: *Without nuclear energy, it will be impossible to cut CO2 emissions in half by 2050. The Germans should also understand this.*

Clearly the IEA does not understand that there is still uncertainty about the US$ one trillion rescue package for bailing out the Wall Street investment banks and President elect Obamas plan to create or preserve 2.5 million job over the next few years by rebuilding old roads and bridges, modernising public schools,and construct wind farms and alternative sources of renewable energy. On November 26 the long term estimate of the cost of the measures proposed to prevent a depression in US was 4 trillion US$ which great increase the US governments national debt. Some of the employment creation measures will implement he measures advocated by the IEA however the problem is growth in US national debt.

What seems certain is that the US consumes 25% of the world's oil but in the next decade it may not be able to afford investment in carbonless energy technologies, large scale oil exploration and production in deep water or nuclear power. The US will become more dependent not only on oil imports but on fuel efficient car imports and Japanese companies will make more cars in the US than Ford or Chrysler.

The IEA annual report, the *World Energy Outlook 2008,* officially released on November,12 explains in detail how the world will struggle to meet oil demand because output from the world's oil fields is declining faster than previously thought. According to the UK Financial times this is the first authoritative public study of the biggest oil fields throughout the world. According to the Financial Times:-

> *Without extra investment to raise production, the natural annual rate of output decline is 9.1 per cent. The findings suggest the world will struggle to produce enough oil to make up for steep declines in existing fields, such as those in the North Sea, Russia and Alaska, and meet long-term demand. The effort will become even more acute as prices fall and investment decisions are delayed. The IEA, forecasts that China, India and other developing countries' demand will require investments of $360bn each year until 2030. The IEA says even with this investment, the annual rate of output decline is 6.4 per cent. The decline will not necessarily be felt in the next few years because demand is slowing down, but with the expected slowdown in investment the eventual effect will be magnified.* (Hoyos and Blas 2008**)**

The *World Energy Outlook 2008* IEA head Nobuo Tanaka has made it very clear that reducing our dependence on oil will require so many trillions of US dollars and Euros to fix it that it may not be acceptable to the G20 nations or the rest of the world.

4. 0 Negative synergies with the toxic debt crisis in the US, EU and Asia

The European Central Bank (ECB) will probably take a dim view of the IEA's proposal to spend many trillions of Euros and US$ on alternatives to oil. The ECB has been directing all of its energies deleveraging the dangerous levels of debt in the European banking system and is still desperately hoping that the panic in Wall street does not get out of control.

The sub-prime crisis impacted the US stock market in 2007. From the the 1st November 2007 to October 29 2008 : the US Dow- 40%; the German Dax -44%; France's CAC- 47%; Japan's Nikkei. -53%. . Hundreds of billions of dollars from hedge funds, institutional investors and even sovereign wealth funds poured into Brazil, Russia, India and China seeking huge returns from the world's fastest growing economies. So when the sub prime debacle started 'taking the legs out' of the financial sector in mid-June 2008, and the massive deleveraging process began, money rushed right back out of those economies, taking their stock markets down sharply by October 22nd 2008: Brazil - 59%; Russia -72%; India - 62%; and China -62%. All of them are still in trouble what is unknown is how far down they may go and how long it will take to get back up

If the ECB's deleverage fails to control the credit crisis in Europe it will get dramatically worse and put an end to any hope of new investment to reduce oil dependency and a painless reduction of carbon emissions. Assuming the international debt crisis is brought under control with only a minor recession the best prognosis is from Nobuo Tanaka IEA Executive Director speaking about renewable energy sources in Berlin:-

> *Oil prices should ease in coming months but extreme weather conditions and labour disputes in the industry could create new supply bottlenecks. However, no dramatic bottlenecks were to be expected between now and 2010 because oil supply was relatively generous compared to demand, But after 2010, and above all after 2013, the situation would become more difficult because there was no immediate prospect of new reserves coming on to the market and this would affect prices.* (Wacket 2008)

Even so the toxic debt crisis has already reduced the demand for oil by around 1.3 million barrels a day and reduced its price. Global oil production has remained level since 2005, despite significant investment and rising prices. West Texas crude oil on October 29 fell to $63 from the record $147.27 a barrel reached on July 11. If the world economy goes 'belly up' it will reduce the demand for imported oil and fossil fuels for a few years after peak oil and that will reduce CO2 emissions in the most painful way for a billion or more people in the developed countries.

In 2008 derivatives have proved to be financial weapons of mass destruction and they are still doing incredible damage right across the worlds finance system, how many unexploded derivative mines remain to claim innocent victims is still unknown. The economic future is most uncertain. The worst case scenario for the US, the EU, Japan, China and India is having to ration oil for essential uses, as was done in World War 2, and putting the economy on a war time footing as the measure of last resort. to contain a 1929 category financial meltdown. Strange as it may seem the over reliance on computer modelling by the Federal Reserve Bank and other national banks contributed to the failure to properly regulate derivatives and other toxic innovations of financial engineers.

The former head of the US Federal Reserve bank who failed to put in place regulatory measures to prevent the spread of these toxic derivatives on his watch has written about his mistake of relying on computer models using untested assumptions (Greenspan 2007) The essence of what Greenspan says is on pages 520-521:-

> *"The essential problem is that our models - both risk models and economic models - are still too simple to capture the full array of critical variables that govern global economic reality . A model is an abstraction from the real world..... "Business cycle and financial models still do not adequately address the innate human responses that result in swings between euphoria and fear and repeat themselves from generation to generation with little evidence of a learning curve.*
> *But forecasters' concerns should not be whether human response has been rational or irrational , only that it is observable and systematic. This too me is the large missing explanatory variable in both risk management and macro economic models".* (Greenspan 2007)

The melt down of the world financial system is a good back drop to the grossly over optimistic reflections In Alan Greenspan's memoirs which were published in 2007 and totally underestimated the extent of the damage done in second half of 2008. However an article in New Scientist (Mackenzie 2008) about the need to acknowledge the inherent unpredictability of the global financial system and complexity theory endorses Greenspan's views on the problems with current financial and macroeconomic models.

In the real world modelling in transport planning or forecasting future CO 2 emissions the assumption that the Goldie Locks economy would prevail to 2030 and beyond assuming a steady growth of GDP, economic stability and a continuation of business as usual. Is clearly false. If we are going to have computer modelling we need to get it right and take into account the complexity of the real world. There has to a hierarchy of models that are linked with common assumptions based on facts. At the top of the hierarchy of models their needs to be a sound models of global financial and economic systems, backed up by global climate and resource usage models. All other modelling should be compatible with these and it is clearly not today.

5. Negative synergies with the toxic debt crisis in Australia

Australia has far less toxic debt to deal with and the banks have been more responsible so it may be possible for Australia to fund and create an oil conserving infrastructure with less car use, greater use of public transport and non-motorised transport. According to ANZ chief executive Mike Smith :-

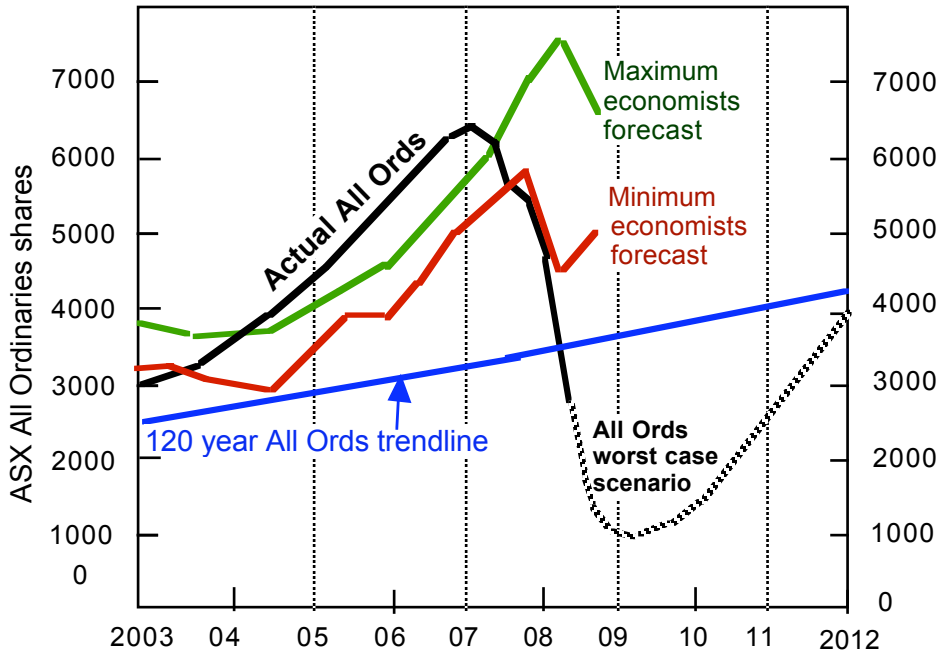
> *Australia's Big Four banks are among just 18 in the world given a AA rating by Standard & Poor's, while all Australian banks rated by the agency are BBB or higher. The Australian Prudential Regulation Authority (APRA) has in the past*

been considered heavy-handed by the banking fraternity, but as more lightly regulated banks in the US and Europe are in trouble, its diligence in policing authorised deposit-taking institutions is paying off. APRA says its role is not to eliminate all risk in financial services, which is necessary for any enterprise that seeks a return, but is instead to "ensure that those financial entities that we regulate meet the promises that they make to depositors" (Sharp 2008)

The financial crisis is likely to last to at least the end of 2009 and is likely to damage the real economy for years to come. The ratio of private debt to GDP is now more than double the levels that triggered the Great Depression. Australia's current level of private debt is now 165 percent of GDP. while in 1929, the ratio was 80%.

What may happen in Australia is shown on Figure 2 which uses use data from the Age Economic Surveys produced in July and January each year from 2002. Figure 2 shows the forecasts of 20 economists of the ASX All Ordinaries (All Ords) for 12 months ahead. from 2002 to 2009 and the actual All Ords from 2002 to Nov. 1st 2008.

Figure 2. Comparison of economists forecasts of next year's growth of ASX All Ordinaries shares and their actual growth from 2002 to 2009. Projection of the worst case scenario from 2008 to December 2012.



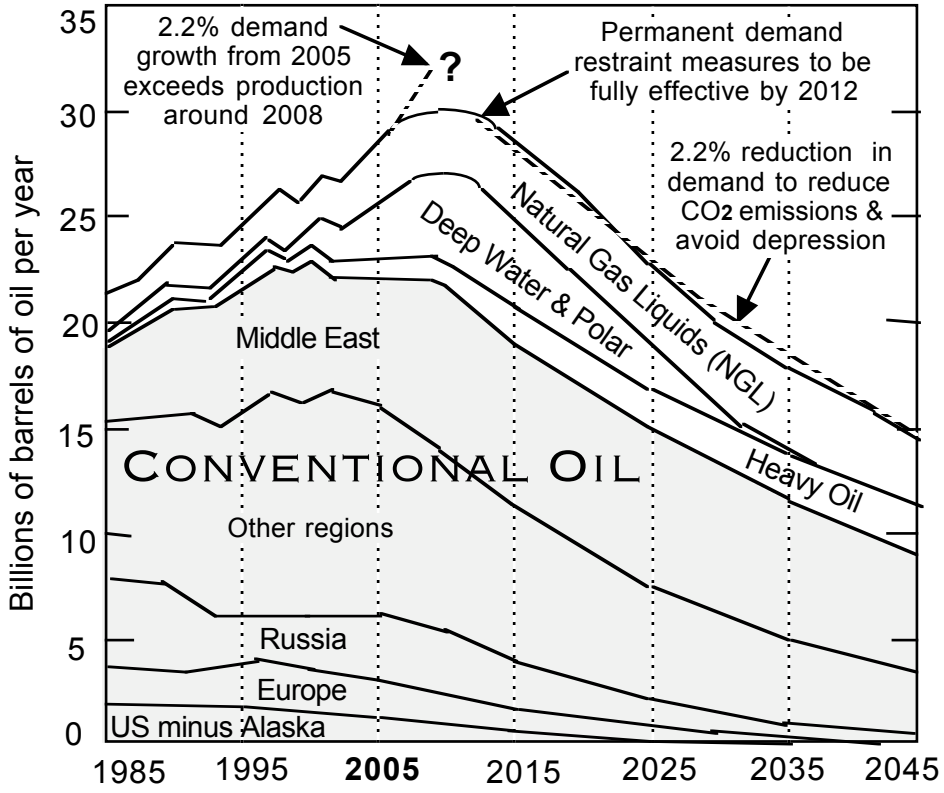
Data source: Melbourne Age 6 monthly Economic Surveys and unpublished research by Alan. A.. Parker

There is a maximum and minimum forecast curve to show the spread of forecasts between the economists and how all of them underestimated the growth of the All Ords from 2004 to 2007 and theirunderestimate of the All Ords decline in 2008.

Figure 2 shows the forecast by this writer of what would happen to the All Ords in a 1929 category economic depression. (which would probably create an unemployment rate of around 28% as it did 1930). The graph shows an extension of the 120 year line from 2002 to 2012 and indicates the excessive growth of the index from 2002 to 2008. Note that the area under the All Ords, the trend line from 2002 to 2008, is the same as the area beneath the trend line from 2008 to December 2012. Also the All Ords growth rate back to the trend line is similar to the growth from 2002 to 2007.

6.0 The Association for the Study of Peak oil (ASPO) has a good track record

Figure 3 uses data produced by ASPO in 2005 in the same year that the BTRE. , the IEA and OPEC made their flawed forecasts of the price of oil in 2010 and 2030 (shown in Table 2). The most recent ASPO data for 2007 are not significantly different to its 2005 estimate (shown below) and are far more accurate than anything produced by ABARE..



Source: Oil production data from the April 2005 newsletter of the Association for the Study of Peak Oil www.asponews.org

Figure 3 The decline in conventional oil production from around 2010

Figure 3 indicates the need to reduce world oil consumption by 2.2 % per year by decoupling the growth in oil consumption from the growth of GDP and persuading regional neighbours to do likewise. The risk of conventional oil (excluding carbon intensive non conventional oil) peaking and then declining by 2012 is highly likely .

6.1 New IEA , ASPO and the OIL and Gas Journal peak oil publications

The *World Energy Outlook 2008,* forecast is a lot more pessimistic than the trends shown on figure 3 and greenhouse emissions increase to a catastrophic level by 2030 that would take the escalation of global temperature well past the point of no return. This implies the possible extinction of most of the human race by 2100.

Geological constraints and geopolitical problems are going to ensure that oil shortages are inevitable. The easy to extract light and sweet conventional oil is a finite resource that has already peaked or will peak in a year or so. The IEA reports are now available. Main report purchase from IEA home page page: **http://www.iea.org/weo/**

Executive summary *World Energy Outlook 2008* :
http://www.iea.org/weo/docs/weo2008/WEO2008_es_English.pdf

Key graphics: **http://www.iea.org/weo/key_graphs_08/WEO_2008_Key_Graphs.pdf**

Press release:
http://www.iea.org/Textbase/press/pressdetail.asp?PRESS_REL_ID=275

A new ASPO publication *"An atlas of oil and gas depletion"* by C. J. Campbell, reviews the status of oil depletion in 65 countries, which are summed to give regional and world totals. The work , which would provide a framework for analysis, is available for around US$200 from www.jeremymillspublishing.co.uk

The Oil and Gas Journal also publishes what sounds like a comparable study by Rafael Sandrea costing US$4,500, entitled *"Future Oil and Gas Supply"*

7.0 The laws of supply and demand cannot create more of the good oil.

Increasing the price of crude oil on the the market does not create more of the good oil, all it does is increase the supply of sour and heavy oils. After half of the oil in a reservoir is extracted the quality and quantity of the remaining extractable oil declines until all that is left are the viscous dregs, saturated with sulphur and /or other pollutants. Increasing the price of conventional oil also makes makes it more economic to extract and process tar sands, oil shale and coal to make refined oils. These non-conventional oils have a much lower energy return on energy invested and increase CO2 emissions 3 to 7 times. (Parker 2007)

The modelling of the energy costs of conventional and non conventional oil in the long term in Australia by CSIRO confirms that the emissions of CO2 will increase per barrel of oil produced:

"the energy return on energy invested (EROEI)" in finding, extracting, transporting and refining oil will decrease. The reality is that the energy costs and benefits of oil extraction do change for the worse over time, and CSIRO scientists,

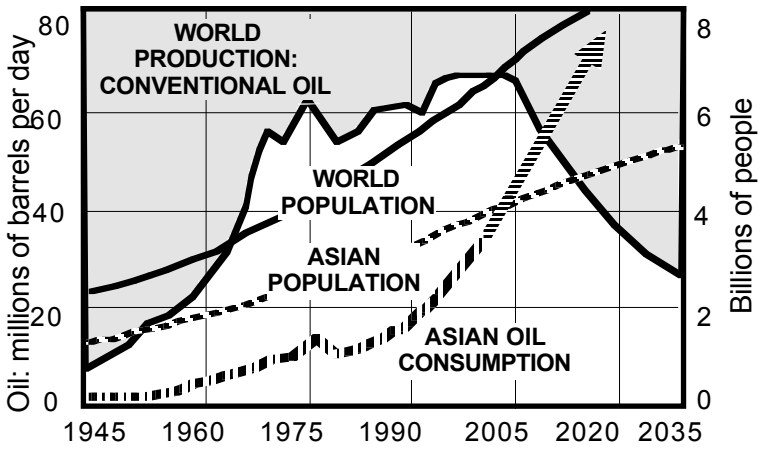
recommend that physical energy profit accounting procedures should complement monetary accounting procedures for all important energy companies and national accounts ". (Foran and Poldy 2002).

The increasing energy costs of discovering and extracting conventional oil apply generally to other new sources of conventional oil in deep water and hazardous locations. Tomorrow's extraction, refining and use of oil will produce more CO2 emissions per barrel than it did 30 years ago and will increase its cost relative to more abundant fuels such as coal. (Foran and Poldy 2002)

8.0 Other negative synergies with other resource shortages by 2030

There are other well-known resource depletion problems for many countries occurring in the same time frame as peak oil; world shortages of natural gas, low sulphur coals, fertiliser and fresh water supplies without which food production will be put at risk and carbon dioxide emissions will increase. Climate change threatens to increase the number of the world's hungry by reducing the area of land available for farming in developing countries.

Sixty-five developing countries, home to half the developing world's population, risk losing about 280 million tonnes of potential cereal production as a result of climate change. This loss would have a value of US$56 billion, or 16 percent of the agricultural gross domestic product of these countries. Climate change will drastically increase the number of undernourished people, severely hindering progress in combating poverty and food insecurity (Brown 2007).



Source: PEST
Alan Parker 2005

Figure 4 Peak oil and the growth in population, oil consumption

The synergetic interaction of oil depletion with other environmental "time bombs" that have been ticking away for many years will result in world food production peaking and then declining at a rapid rate in a few years. Conventional oil production is declining in the same 30-year time frame as increased drought,

storm damage and rising sea levels due to global warming; a decline in fresh water availability and quality; increasing salinity and soil loss. All of these environmental problems are beginning to reduce food production. World stocks of food grains have reached critically low levels that put the survival of 100 million people at risk. (Weisman 2008)(Parker 2005 A)

Figure 4 shows the trends for the growth in the Asian and world population, the faster growth in Asian oil consumption and the peaking of conventional world oil production. Continued population growth and the faster growth of GDP in Asia have escalated the demand for oil and put the oil needs of Asia on a collision course with the western world. It is not possible to feed the world without low cost oil supplies to power food production. This is a political recipe for disaster.

To reduce greenhouse gas emissions and conserve oil resources a significant percentage of the world's motor vehicle fleet of 900 million will need to be replaced with vehicles relying on batteries. The lightest and most efficient of these are lithium Ion batteries which are the batteries of choice for the next generation of electric vehicles. There is uncertainty about future supplies of the lithium carbonate and their future as batteries for the next generation of motor vehicles is in doubt. However lithium Ion batteries which use portable electronic equipment and electric bicycles may be feasible. (Tahil 2006)

9.0 Innovative transport solutions that increase energy efficiency

Reduced CO2 emissions must be taken into account for both fuel consumption and the embodied fuel use and emissions involved in the manufacture of cars. The most difficult problem is that, in the outer suburbs of the capital cities, there are hardly any public transport services and what services there are do not go where people want to go. Lower density housing and poor pedestrian access ways make it very difficult to access the limited public transport services by walking.

Figure 5 indicates the need to extend public transport services in outer suburbia; to provide safe and secure bicycle access routes and storage at rail stations, and express and trunk bus stops. The use of bicycles and electric bicycles has great potential as an access mode to new public transport services. Figure 4 shows the need for petrol and diesel fuel efficiency standards, the objective of which is to reduce the size and increase the fuel efficiency of the Australian vehicle fleet by making more energy efficient cars available. Encouraging people to use new car hire co-ops and share cars to access public transport is also important.

The fuel efficiency challenge cannot be met by just using using more fuel efficient cars there is also a need to change lifestyles and reduce the per capita kms driven and to carry more passengers. There is a need is to replace incentives to overuse cars, such as in salary packaging schemes, and replace them with incentives to ride bicycles and use public transport and to buy the latest and safest electric bicycles made to Japanese safety standards which Australian consumers cannot buy because of obsolete regulations.

The adaptation measures of transport mode shift and lifestyle changes can best be made at local government level by the promotion of Travel Smart programs supplemented by the provision of safe bicycle route networks that provide safe and secure access to public transport. The Commonwealth's role in the development of all these transport innovations is at the strategic planning level, in the funding for bicycle and pedestrian infrastructure and in the provision of tax incentives. The use of bicycles as feeders to buses is well advanced in Europe and there is scope for using bicycles as feeders to shared cars for commuting.

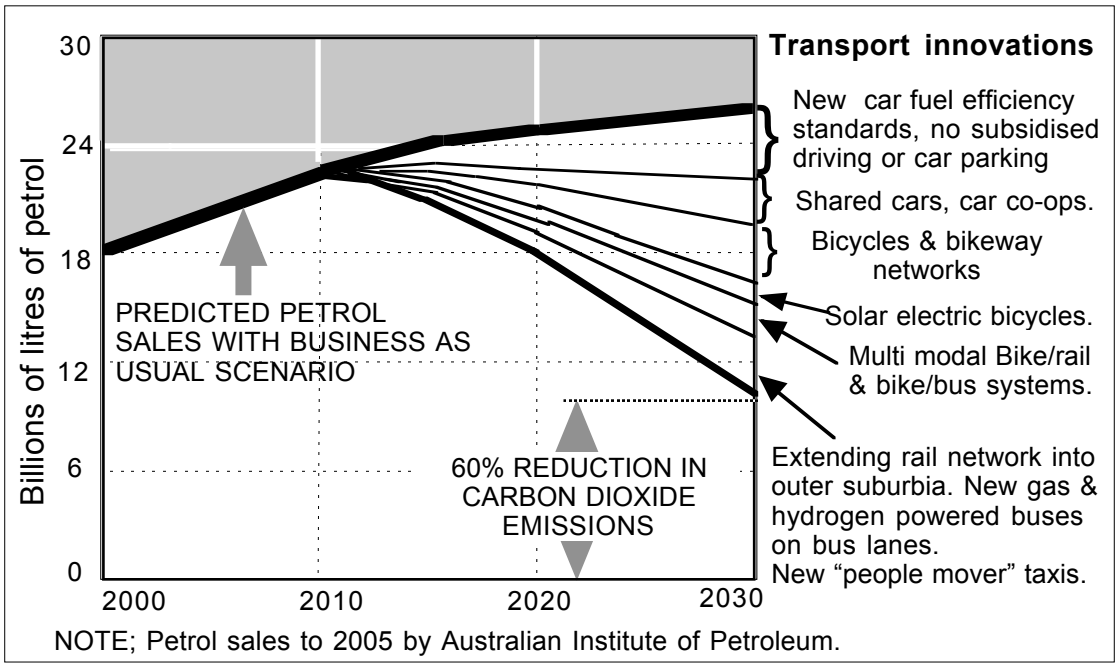


Figure 5 Transport innovations that reduce CO2 emissions by 60%

Railways have been neglected for 30 years. More energy efficient locomotives are now becoming available and could reduce oil dependence and reduce Australia's contribution to global warming. Australian freight and passenger rail infrastructure has taken 100 years to build and is more or less complete with the rail reserves of services no longer in use still being available in most rural areas. A lot of the rail tracks need upgraded and many extensions are needed to the urban rail networks.

Railways could triple the use of non-bulk rail freight, greatly, use the new Melbourne to Brisbane inland rail link and create a more sustainable transport system. In the longer term energy efficient high speed intercity trains are needed to to replace intercity air travel which is totally dependent on liquid fuels.

The introduction of hybrid cars and trucks powered by compressed natural gas will be feasible. Given Australia's sunny climate the widespread use of electric bicycles with batteries charged by small solar cell arrays at home will be feasible in ten years.(Parker 2006)

Figure 6 A 250 watt electric bike that cannot be purchased in Australia because the Australian road agencies cannot get their act together to change the road rules so that Australians can buy the safest , lightest and highest quality electric bikes on the world market. Note the small Ion lithium batteries

The fuel efficiency measure used today is litres of fuel per 100 vehicle km, which is a good measure of engine efficiency but a misleading measure of the efficiency of the car, 4WD and bus fleets. The efficiency of public transport vehicles and vehicle fleets should be measured in litres of fuel per 100 passenger km; High vehicle occupancy rates are necessary for public transport vehicles and this should also apply to vehicle fleets.

CONCLUSION

The conflation of peak oil, climate change and a deep recession make the EES modelling for the Frankston bypass obsolete. The EES fails to take into the most likely impact of the worsening international recession on the Australian environment, the economy and the car industry. The modelling of future transport trends fails to take into account the increase in fuel prices and probable oil shortages that will greatly increase the demand for public transport and reduce car traffic in Melbourne and EES area till 2030. Above all it is not acceptable to approve the building of infrastructure that will generate more CO2 emissions and contribute in a small but significant way to what in the life of that infrastructure will be catastrophic increases in temperature. The resources wasted on building the bypass need to be spent on developing alternative and more sustainable means of transport.

Single occupant car driving for long commuter trips to work needs to be discouraged so as to free up road space for shared cars buses and commercial vehicles. In particular all comparisons between vehicles of fuel efficiency and pollutants should be estimated in terms passenger km travelled.

There is no reason at all why the average fuel consumption of passenger car fleets should not be 2 litres or less per 100 passenger km and occupancy targets set for different classes of cars. Transport planning should be based on a vision of a relatively smaller car fleet per thousand population and that carries more passengers on each trip. To achieve that the the car industry needs protected so that it can produce fewer but higher quality cars that are far more fuel efficient per passenger km. The introduction of hybrid cars and trucks powered by compressed natural gas will be feasible.

The money needed to build the bypass should be used to build an urban bikeway network in the EES area and to provide extensions to rail lines and express bus services. Given Australia's sunny climate the widespread use of electric bicycles with batteries charged by small solar cell arrays at home will be feasible in ten years.(Parker 2006) If that happens CO2 emissions can be greatly reduced and there will be no need for the Frankston bypass.

The EES fails to show that the bypass will generate even more unsustainable car trips because it is so full of flawed assumptions and flawed computer modelling .

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