



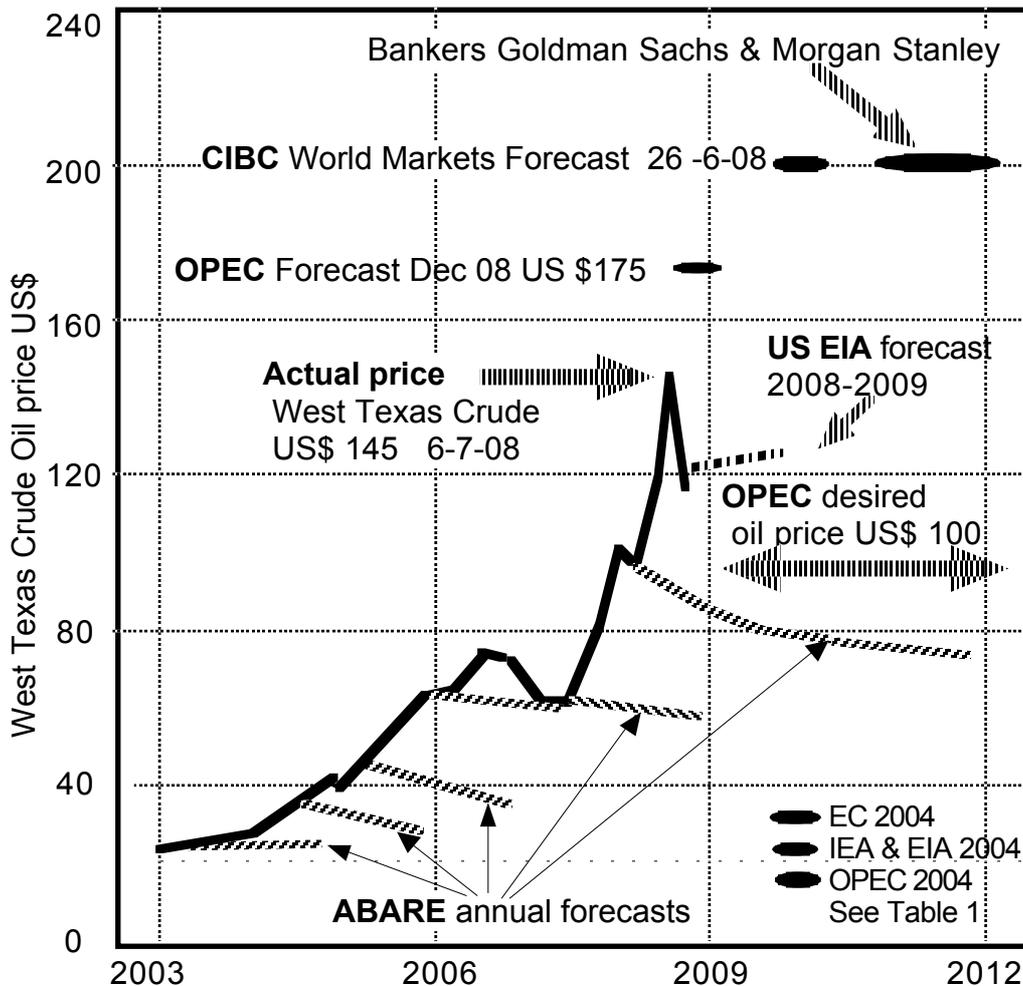
People for Ecologically Sustainable Transport

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Surviving peak oil and decarbonising the economy during an economic depression due to toxic debt requires radical changes in the tax system

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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



PEST Submission to Australia's Future Tax System Review

Introduction

A sound tax system that changes behaviour is needed to create an economy that is ecologically sustainable and to cope with the negative synergies of climate change, peak oil, and an unstable world financial system that threatens our national security. Underlying these threats is the fact that 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%. The growth of toxic debt, like the growth in oil dependence, carbon emissions and peoples waist lines, is not sustainable. Neither is the existing tax system which is part of the problem and not part of the solution (Tabakoff 2008)

The transport sector is increasingly dependent on foreign sources of crude oil and is the fastest growing source of carbon pollution. 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 tax system silver bullet to reduce our addiction to imported crude oil – instead we need a package of taxation measures to reduce per capita oil use in an equitable way to cope with the inevitable shortages.

The threat of an economic depression induced by toxic debts in the US was countered by the U.S. Senate agreeing to allocate, on October 2nd 2008, around one trillion US\$ to save the financial system. and the European Central Bank is also co-ordinating a similar bail out of toxic debt in the EU. Whether or not this prevents the wheels falling off the world economy is still in doubt. Just as the consequences of peak oil are still in doubt; reflecting the level of uncertainty and incompetence in high places. The failure to predict future oil prices over the last five years by the world's major energy and transport agencies should have been anticipated (see figure 1) Nearly all financial and political leaders, neo-conservative free traders and big oil, energy and transport consultants ignored the geopolitical and geophysical realities underlying the volatile growth in the price of oil in the last three years.

Until 2005, in the developed countries, asset values, national GDPs and world oil production had been assumed to keep on growing steadily for the next 30 years without any risk of a major economic depression. By 2008 we see these unsound assumptions challenged by reality. Australian forecasts of the growth of oil demand were merely copycat projections of the world's major energy agencies, particularly the International Energy Agency (IEA).

Australia may have a far lower proportion of toxic debt than the U.S. but it is just as vulnerable to future oil shortages. Figure 1 shows the inaccurate forecasts of oil prices by the Australian agencies ABARE and BTRE , by the International Energy Agency and by OPEC within the last five years. Also shown are forecasts in 2008 by leading US banks and financial consultants predicting that oil prices could increase to US\$200 a barrel by 2010. Indeed, the price of crude increased to US\$147 in July 2008, more than five times the price of crude oil in 2003. (ABARE 2005)(BTRE 2005)(CIBC World Markets 2008) (Ward 2006)

Victorian and NSW state planning and road agencies have failed to take the coming decline in world oil production into account in transport and land use planning because of these flawed IEA forecasts. In the Victorian East West Link Assessment study document that factored in oil prices it stated that it could be as low as US \$35 a barrel 12 years from now (SKM 2008 A). State transport strategies failed to recognise the need to ration oil for essential purposes perhaps within the next decade. Worse still, the rise of petrol prices since 2003 has increased the demand for rail passenger transport in Melbourne and Sydney. In 2008 they are becoming incapable of safely satisfying the demand for more rail services for travel to and from work.

The former Commonwealth Greenhouse Office (AGO) estimates of future CO2 emissions are based on computer models that use low oil prices and a stable economy as their input to calculate high levels for future oil demand in transport to the year 2030. These models are all flawed because they fail to take into account the low or zero economic growth that will result from toxic debts and high oil prices. In 2008 the only certainty is that increasing oil dependency increases the risk of an economic depression which could then reduce the demand for oil and reduce CO2 emissions in the most painful way possible.

An enhanced rail network and express bus network will need to be extended into outer suburbia as an absolute necessity on social equity grounds. If this does not happen the people living in outer-urban and rural areas will be disadvantaged by very high oil prices and within a year or so the well being of almost all city dwellers could also be under threat. The price of food and other products which embody oil products such as plastics and fertiliser will also rise. Maps showing those suburbs most at risk from high oil prices in the capital cities are available (Dodson and Sipe 2008).

The main objective of this submission is to advocate reducing the current dangerous level of oil dependence by the provision of tax incentives and disincentives for investing in ecologically sustainable transport infrastructure that increases walking, cycling, high occupancy public transport and shared motor vehicle use. The practical way to adapt to the inevitable decline in world oil production is to risk manage the threats of oil depletion, toxic debts and climate change together. The good news is that the Garnaut Report sets out the sound and practical transport and other options to decarbonise the economy. That was being completed at time the financial system started unravelling and the final outcome is unknown and is unlikely to be known before early 2009. There will be enough time to take the outcome into account for the final version of the tax system review.

This submission details the failure of government agencies to predict huge increases in the price of oil in a stable financial environment and / or in an economic depression due to toxic debt that denies Australia the capital to invest in renewable energy resources as recommended by the International Energy Agency (IEA 2008). This is why the Future Tax System Review panel needs to take on board the need for a tax system which encourages frugality and the conservation of oil because they are essential for the preservation of a democratic way of life and to combat climate change.

OIL DEPLETION: the unsound forecasts of ABARE

The Australian Bureau of Agricultural and Resource Economics (ABARE) was 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. Worst of all,, ABARE has 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.

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 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 even 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.

The unsound forecasts of the Bureau of Transport and Regional Economics (BTRE)

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 1).

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. The Tax Review needs to recommend creating an “Australian Strategic Oil Reserve”

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), which owns 77 percent of the world’s proven oil reserves, forecast only US\$19 a barrel for 2010 and 2020.

Table 1 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).

The price of West Texas Crude was \$US 145 a barrel on the 16th July 2008., an event which was not anticipated at all by the BTRE which assumed that the price of oil in 2020 would be

around \$US25 a barrel. These unsound forecasts were also assumed to be true by many government economists who did not know that the data used in these forecasts were mostly derived from the nationalised oil industries of dictatorial regimes. They trusted national oil companies who 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)

The IEA and OPEC have failed the peoples of oil importing and producing nations

Some international agencies do not learn much from their mistakes. For example, on May 22nd 2008 the IEA overestimated 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 (Birol, F) stated recently (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)

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 for 2010 was a very low US \$19 a barrel (see Table 1).

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 may not be sufficient to substantially reduce the price.

Conserving enough 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 power 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 for 10 years or more.

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 the next US administration will not be investing a trillion or more US\$ in renewable energy and/or nuclear power because its toxic debt problem has already seriously damaged the economy. There is uncertainty about the bipartisan US \$840 billion rescue package for bailing out the Wall Street investment banks proposed in the first week of October 2008. Will it heal the sick economy or will the economy sink further into a depression? What seems certain is that the US consumes 25 % of the world's oil but will not be able to afford investment in carbonless energy technologies or nuclear power.

Ensuring the safe use of nuclear energy and radioactive materials is crucial

The statement by Tanaka that the International Atomic Energy Agency (IAEA) is the responsible body for assessing the long term availability of future uranium supplies is perhaps an unreal expectation. The IAEA is currently starved of funds and is in no position to take on that responsibility. Ernesto Zedillo chaired the international commission that was asked to look into the future of the IAEA which has been responsible for maintaining the global nuclear order for fifty years, but is now struggling to do its job because of a chronic lack of resources. He said that :-

"My colleagues and I were impressed by the agency's technical competence, whether in assessing Iran's nuclear program or helping to fight hunger by using nuclear techniques to breed more resilient varieties of rice. But we were frankly shocked to learn that the IAEA, one of the most respected international organisations, has been operating virtually on a shoestring for nearly two decades. The cost to the world of a single act of nuclear terrorism or a serious accident in a nuclear power plant would be incalculable. In contrast, the cost of strengthening the IAEA to help prevent such catastrophes is modest. The resource situation of the IAEA is now critical. Years of zero growth policies have left the organisation with a failing infrastructure. Vital elements of its work - for example nuclear safety and security - are funded largely on an unpredictable and unstable voluntary basis." (Zedillo 2008)

Ensuring safety in the use of nuclear energy and the security of nuclear and other radioactive materials is important. Unless the IAEA is given adequate human and financial resources it will be unable to properly fulfil this crucial role. The Australian government, before investing in nuclear infrastructure, needs to satisfy itself that the US, the EU and China ensure that the IAEA gets the A\$135 million it needs to do what it can do well. (Zedillo 2008).

The tax challenge for Australia is to have a Swedish style tax on uranium production to sufficiently cover the safest and costly means of disposing of the radioactive waste. Tax incentives for the introduction of wind turbine farms and the location of turbine manufacturing facilities are also essential.

Negative synergies with the toxic debt crisis in the US and EU

The European Central Bank (ECB) will probably take a dim view of the IEA's proposal to spend many trillions of Euro's 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 desperately hoping that the panic in Wall street does not get out of control. If Europe's deleverage gets out of control the global credit crisis 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 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 said;-

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. West texas Crude oil on October 1st fell to \$96.37 percent 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. The worst case scenario for the US and 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.

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. 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)

Global oil production has remained level since 2005, despite significant investment and rising prices. The infrastructure challenge for Australia is to provide the means to enable communities to develop resilience and self-reliance and to use fuels and energy not derived from crude oil. The tax challenge is encourage resilience and self reliance and discourage wasteful activity.

The unsound forecasts of the Australian Greenhouse Office (AGO)

Making predictions of the future growth in oil demand when world oil production is near its peak and decline is no basis for future planning. To put the inaccurate AGO forecasts of Australian CO2 emissions into context we need to appreciate the evidence based recommendations for action on climate change. Further evidence of the need for radical action comes from, the economist and climate change expert Sir Nicholas Stern who says:-

“he underestimated the threat from global warming in a major report 18 months ago when he compared the economic risk to the Great Depression of the 1930s. Latest climate science showed global emissions of planet-heating gases were rising faster and upsetting the climate more than previously thought” (Reuters interview 17-4-08)

Evidence is growing that the planet's oceans - an important "sink" - are increasingly saturated and cannot absorb as much as previously of the main greenhouse gas carbon dioxide (CO₂). Methane emissions from the Arctic tundra are more dangerous than CO₂ and are growing much faster than previously thought, so the absorptive capacity of the planet is less than we had thought, the risks of greenhouse gases are potentially bigger than more cautious estimates, and the climate is changing faster. The huge decline in the area of Arctic sea ice in September 2007 is an indicator that a faster than previously predicted rise in sea levels is on its way. (Spratt and Sutton 2008)

More reliable estimates of carbon dioxide emissions in the transport sector are needed based on crude oil priced at US\$100, US\$150, US\$200, US\$250 and US\$300 a barrel for the years 2010, 2015 and 2020. These calculations should include the impact of a major economic recession at the global and national level.

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

Figure 5 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 1).

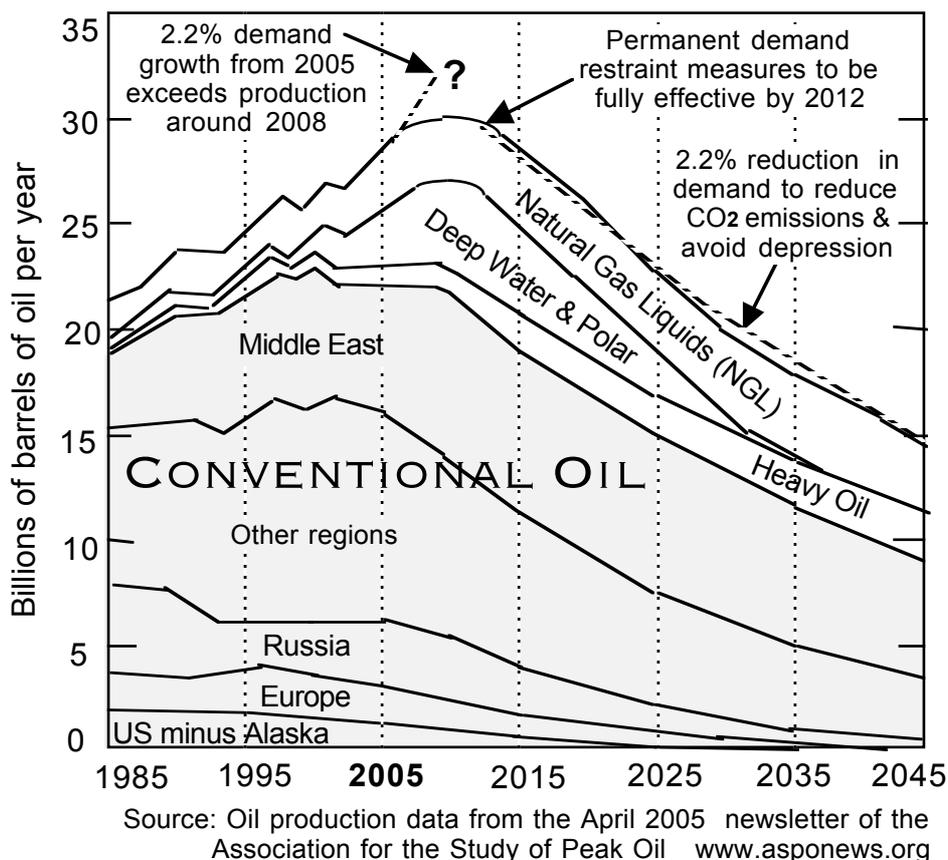


Figure 2 The decline in conventional oil production from around 2010

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..

Figure 5 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 .

Figure 5 shows world conventional oil production increasing by around 2.2% per year from 1985 to 2006, peaking and then declining by 2012, with a 2.2% per annum decline in production to 2045. That means that world oil demand should be reduced to balance it with reduced oil production of 2.2% per year as follows:

- **2007 to 2008:** reduction of 715 million barrels a year,
- **2009 to 2020:** reduction of 660 million barrels a year,
- **2021 to 2030:** reduction of 616 million barrels a year,
- **2031 to 2040:** reduction of 515 million barrels a year,

These figures are indicative only as no one knows yet what the rate of decline will be; hopefully it will be less than 2.2 %. 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.

If the oil consumption of cars and commercial vehicles is allowed to grow by 1.5% or more per annum, it will perhaps create fuel shortages by 2012. To avoid such a disaster, it would be prudent to reduce oil demand by 1% in 2010 and then 2% by 2011 and then by 3% every year. Infrastructure provision must be targeted at achieving this kind of reduction.

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)

Members of the Tax Review Panel need to meet with experts at the the seventh International peak oil conference organised by ASPO at the World Trade Centre in Barcelona,

Spain on the 21st of October More details are available on the official web page: <http://www.aspo-spain.org/aspo7/homephp?idioma=en>

A new 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*”

Other negative synergies with other resource shortages in the next 30 years

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).

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 3 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. What is happening is a political recipe for disaster.

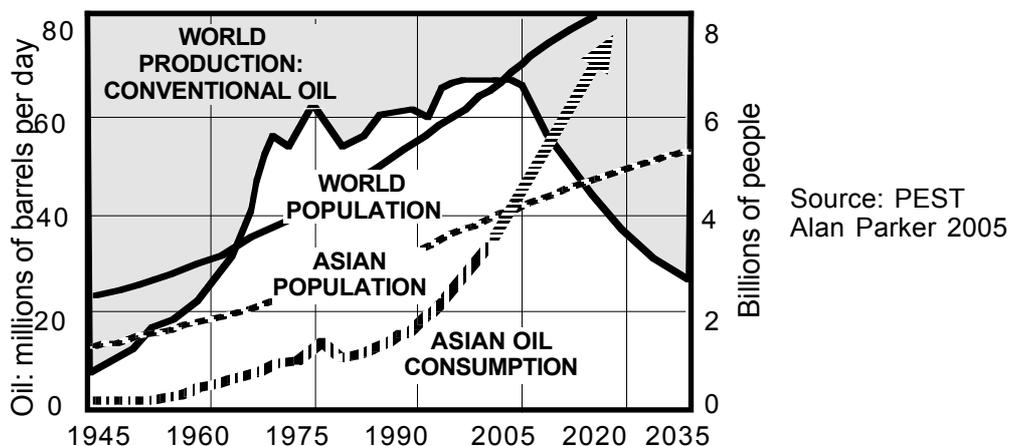


Figure 3 Peak oil and the growth in population, oil consumption

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. However, 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)

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 for many people to access the limited public transport services by walking.

Figure 4 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 share the existing and new car hire co-ops and to use them to access public transport is also important.

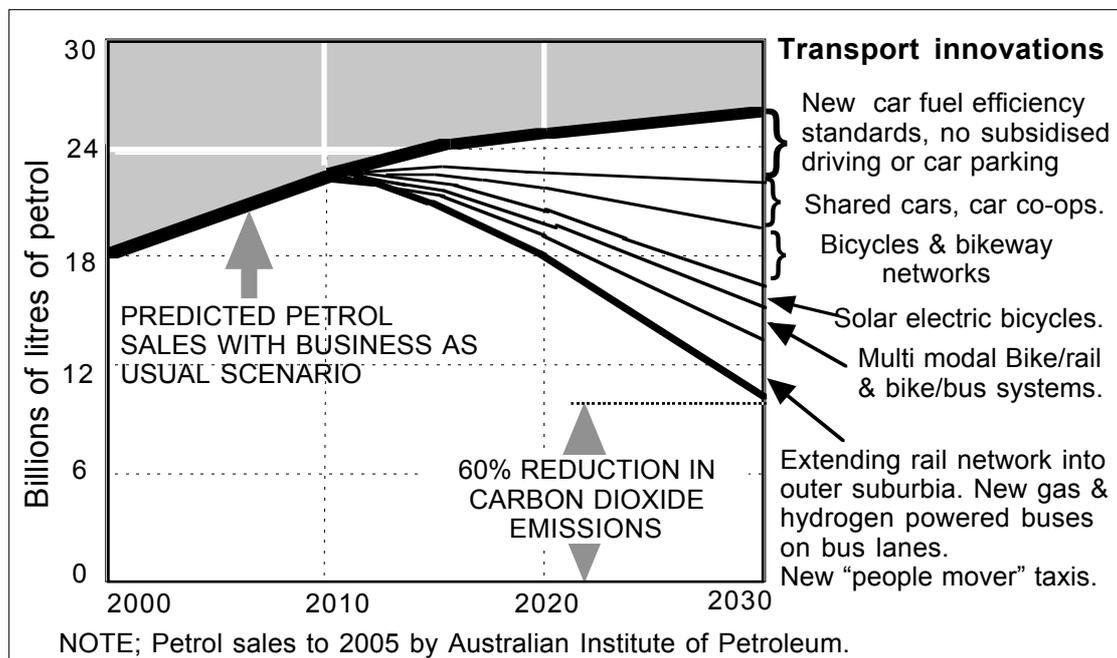


Figure 4 Transport innovations that reduce CO2 emissions by 60%

The taxation challenge 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 bicycle made to Japanese safety standards which a Australian consumers cannot buy because of obsolete regulations. 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 within ten years.(Parker 2006)

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. .

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 in use 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 for our children and grandchildren. 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.

Bikeway networks in the capital cities have far too coarse a mesh

In the inner suburbs of the capital cities there is a partial network of bikeways that is supported by an extensive network of bus and heavy rail routes and some tram or light rail vehicle routes. It is feasible to complete these bikeway networks and extend them into the middle suburbs. These networks can link to rail and bus services as the middle suburbs are mostly well served by public transport. This would reduce car use and oil consumption, particularly for the journey to work for those living in the inner and middle suburbs.

The need is for an arterial network of bikeway routes of finer mesh than the arterial road network. The bikeway route network is far too coarse, with too many breaks in the network and too few shortcuts to encourage bicycle use. For example in Melbourne, after 12 years development, it was only 35% complete in 2007 and not keeping up with urban growth. In Sydney it is much worse but similar to Melbourne in the other capitals. (BFA 2000)

In Melbourne a complete bicycle arterial network would have around 8,000 km of routes (See figure 10) This would provide short cuts for cyclists and pedestrians over and under freeways, railway lines, rivers and other barriers to motor vehicle travel. Main road bikeways on or alongside the roads, linked with traffic calmed local streets and off-road shared footways, are required. The mesh of the bike way network would be 500m x 500m in the inner areas and 750m x 750m in the outer areas, or the rectangular equivalent of these sizes.(Parker 2001)

Most one way streets for cars should be two way for bicycles and roads with bikelanes and should have a maximum speed limit of 50 kph. The introduction of a 50 kph limit on local roads in January 2002 in Victoria and the reduction of the legal leeway given to violators to 3 kph have made these roads safer for cycling and walking. It makes sense to use them to bypass sections of dangerous main roads. In the longer term a 40 km per limit on all residential streets is required, as has been implemented in Unley in South Australia. On outer urban residential streets, without a footpath for child cyclists to use, there should a 30 km /per hour speed limit.

It is necessary to develop well connected fine-grained street networks that avoid no-exit cul-de-sacs, particularly those that do not allow for pedestrian through traffic. The tax challenge here is to allow provide a tax incentive for developers to provide secure bicycle and pedestrian access.

The really difficult task is to greatly reduce car use and oil consumption, particularly for the journey to work for those living in the outer suburbs, most of which are poorly served by public transport. This will require most transport infrastructure funding to be spent on extending the rail network and providing new cycling infrastructure in these outer suburbs which have spread out and are beyond walking distance of stations and express bus routes. The ability to bring bicycles on trains and buses, and/or park them securely at public transport stations, should also be universal and convenient. In vehicle dependent suburbs where trips are dispersed a combination of active walking, cycling , park and ride and public transport is likely to be the most energy efficient means for individuals to arrive at their destination.

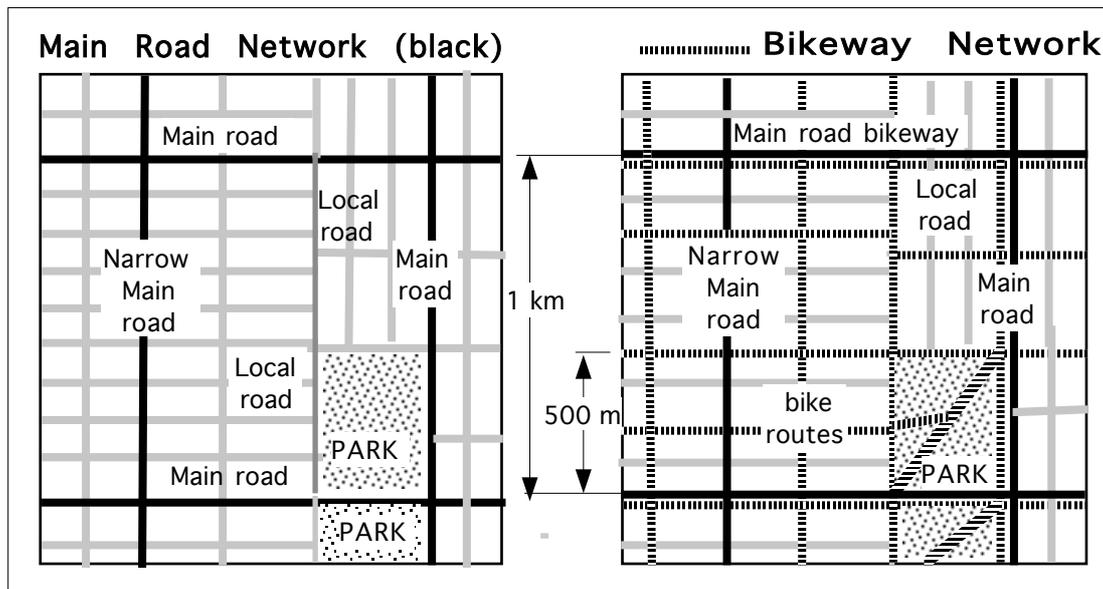


Figure 5 A Bicycle arterial network with a finer mesh than the main road network

Modal interchanges need to become a highly visible focal point of surrounding footpaths, cycle networks, and land use development. Integration between alternative transport modes will thus assist travel patterns that do not use private vehicles for most, but not all trips.

When petrol rationing is introduced, as it inevitably will be, outer suburban households are going to need a bicycle network that connects with the existing rail stations and new rail stations and modal interchanges. Direct cross suburban rail linkages are going to be required for passengers Using bicycles to access stations feeding the cross suburban CBD rail routes will be very important. (Parker 1996)(Parker 2002)

Figure 6 is a 1992 map of Melbourne showing how far walkers and cyclists can go in 7.5 minutes and is based on an estimate of what fit people walking or using geared bicycles can easily do. The map shows the large increase in the area of built up Melbourne that can be reached by bicycling instead of walking. The boundary line of built up Melbourne is shown as a bold dotted line. That boundary line is much further out in 2008 and there are very few stations in these new urban areas.

n 2008 there are approximately 2.5 million (70%) Melbournians living within easy cycling distance (3 km) of a railway station. but only 430,000 (12%) live within easy walking

distance. The science of ergonomics provides hard data on the advantage of using bicycles instead of walking to go from A to B with the same expenditure of physical effort. Figure 6 shows that utilising the ergonomic advantage of pedalling over walking takes the average fit person 3.1 times as far in a straight line and the fit rider using a lightweight racing bicycle with high pressure tires 3.8 times as far. Pedalling instead of walking increases the theoretical catchment area of a railway station 12 times for an ordinary bicycle user and 19 times the area using a racing bicycle.

In Melbourne the potential for safe access to stations is good. Of the 190 stations, around 100 can be accessed safely by bicycle from quiet residential streets on one side or both sides of the rail lines and most of the other 90 stations can be safely accessed on main roads by experienced adult bike riders. There is a need for more rail stations in outer suburbia; these will mostly be too far away to walk to, too time consuming to access by local bus, or not accessible at all by public transport. (Loder & Bayly 1987)

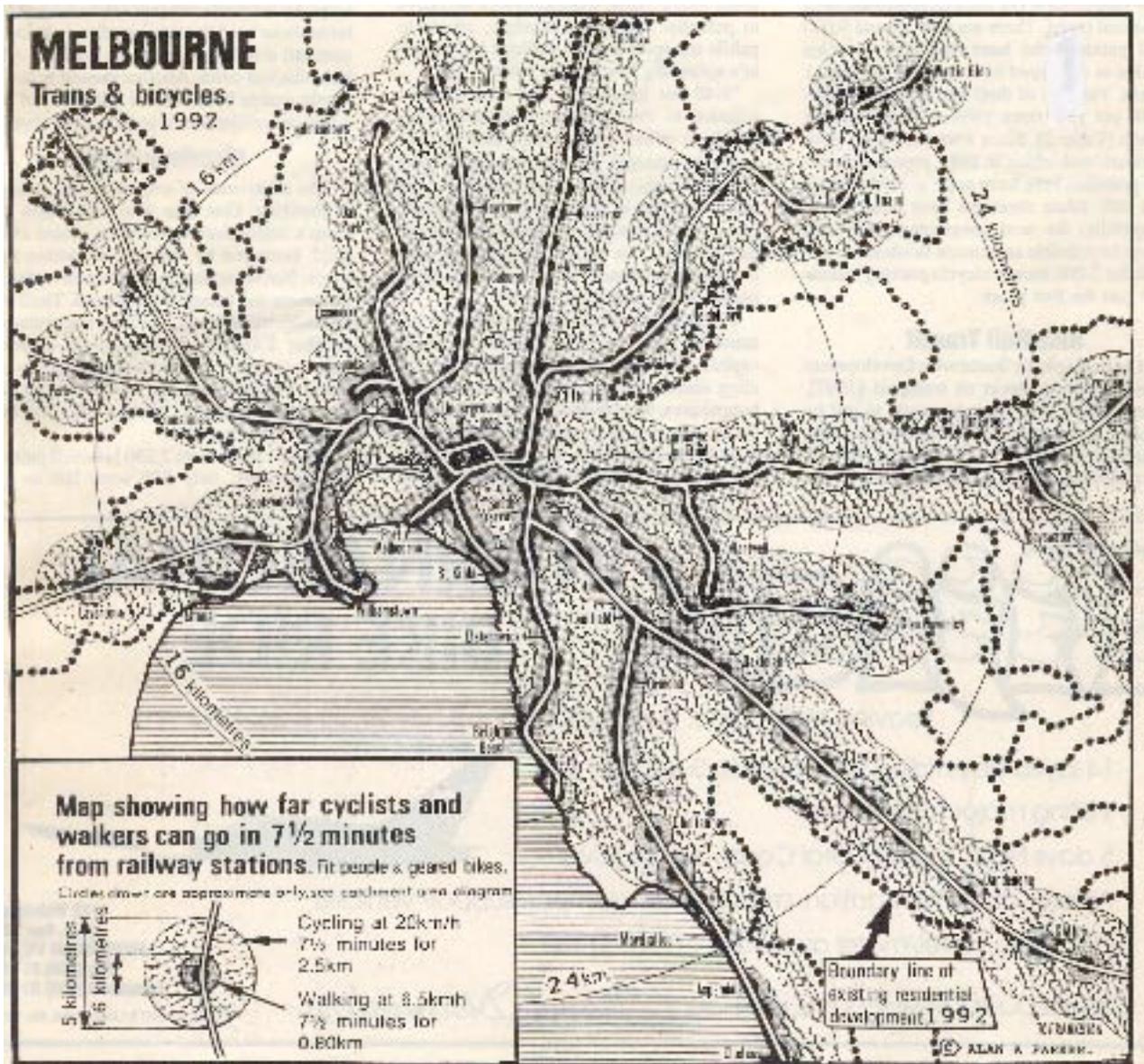


Figure 6 Melbourne (1992) showing access to rail stations by bicycle and walking

Bicycle theft and vandalism are serious problems at stations all over Australia so it is important to provide secure thief and vandal proof storage for bicycles at rail stations and at express bus stops. For example in Melbourne secure bicyclist parking has been ignored since 1970 when a program for building new car parks began. There are now 29,000 people who drive and park cars at rail stations and around 40% to 45% drive less than 2 km, a very easy cycling distance. The average cost of one car parking space, taking into account the opportunity cost and the costs of drainage, is around \$18,000 and twelve bike lockers could be made and installed for that price.

The tax challenge is to recognise the benefits of bicycle parking and to provide a tax incentive to cyclists for commuting directly to places of higher education, factories and offices and for bike/rail commuting.

Green taxes to encourage sustainable transport in the Netherlands

As yet no country in the world has made a total commitment to achieve Ecologically Sustainable Development (ESD) least of all in passenger transport which in most countries, including Australia, has become less sustainable with increasing levels of motorisation. However for 15 years The Netherlands has been moving slowly towards ESD.

The Dutch objective was to slowly decouple the growth of GDP from the growth in fuel consumption (N.E.P.P 1998) The growth in Greenhouse gas emissions from passenger cars has been constrained, the proportion of walking trips has not declined, rail patronage has increased and proportion of “everyday cycling” trips has increased since 1975 (see figure 1). All this was done in order to implement the following Agenda 21 (Rio de Janeiro 1992) transport strategy which all Australian state governments subsequently endorsed:-

Transportation strategies should reduce the need for motor vehicles by favouring high occupancy public transport and providing safe bicycle and foot paths. Municipalities need to be developed in ways that reduce the need for long distance commuting.

The Dutch experience in implementing their National Environment and Policy Plan (NEPP 1, 2, &3) clearly shows that “green taxes”(eco-taxes) have great potential to increase the quality of life while reducing greenhouse gas emissions and oil dependence. Some of these measures are as follows:-

1. greening of the tax system, whereby there is a shift from the taxation of labour to the taxation of environmentally harmful activities. Direct taxation of wages and incomes will be reduced while taxes on consumption will be increased. (Depending on the environmental implications of that consumption).
2. Increase in fuel tax rates (1995); increase the variable component of motoring costs by increasing excise duty on motor fuels (1997).
3. Value-added tax incentives for employers to provide bicycles (1996) Reimbursement of cycle commuting costs in wages and income tax (1997)
4. Increase in scope and magnitude of the tax allowance for trip to work travel costs by means of public transport and the tax free reimbursement of public transport costs in wages and income tax (1997); increased allowance (1998)
5. Freeze on car commuting tax allowance (1997)
6. Incentives for tele-working in wages and income tax (1997) increased concessions

(1998)

7. Widening and simplification of the wages and income tax concessions for car pooling (1998)
8. Incorporating an environmental component in the excise levied on new vehicles and the annual vehicle tax so as to provide incentives for the purchase of clean, energy-efficient cars, and to optimise the fuel mix.

According to Wellemen, the Manager of the Dutch Bicycle Masterplan, the most important measure in increasing bicycle use in Dutch cities is taxing car parking and reducing car parking on a systematic basis in inner urban areas. (Welleman 1998)

Figure 7 shows how much more energy efficient the Dutch car fleet is compared to the Australian **urban** car fleet. **Urban** Australia and The Netherlands have almost the same population, surface area and per capita GDP so this is a relevant comparison for the purpose of assessing the importance of environmental planning for changing transport behaviours.

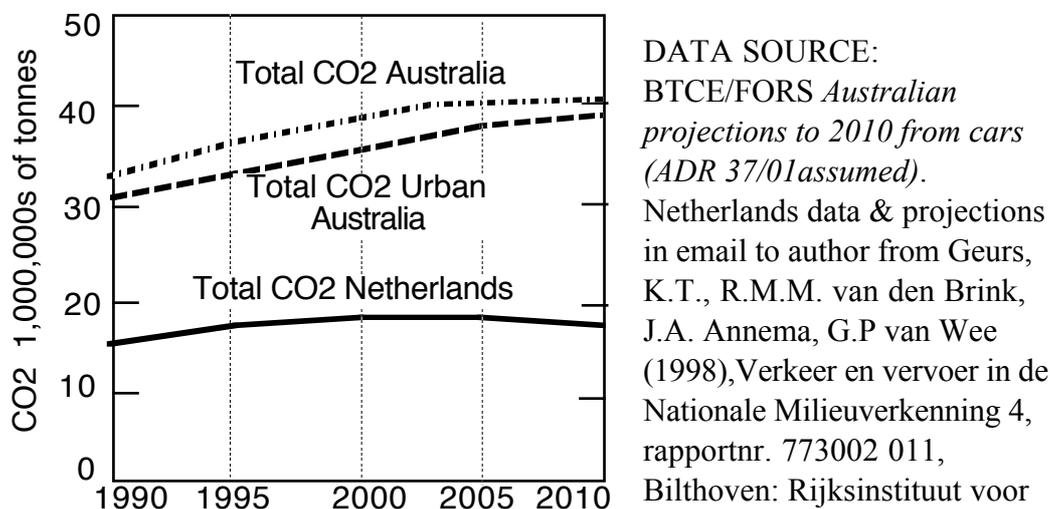
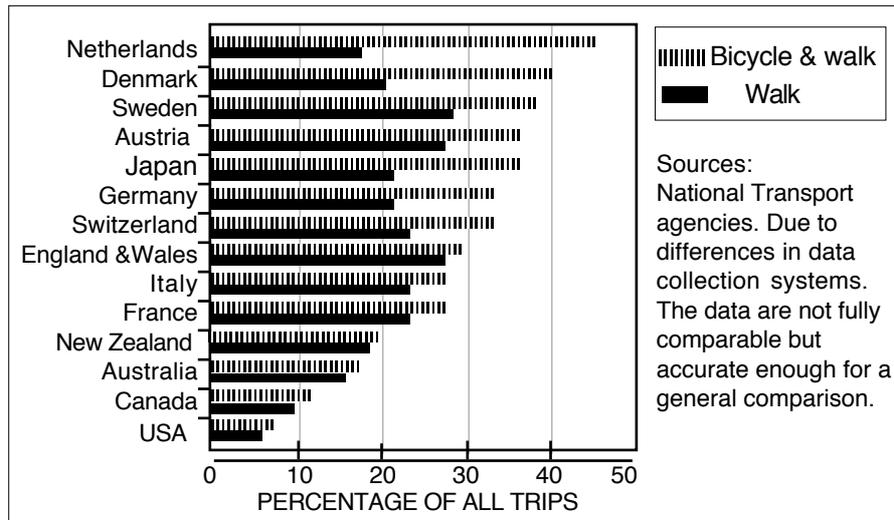


Figure 7, Australia and the Netherlands: Passenger Car Emissions 1990 to 2010 of CO2 emissions from passenger cars:

What the Dutch experience shows is that carbon trading needs to be backed up by eco-taxes to replace current tax incentives to overuse cars if unsustainable trends are to be reversed. The high level of bicycle and walking trips shown on figure 8 demonstrates the potential of high levels of bicycle use can be created by the provision of infrastructure and taxes.

The Australian tax system should be based on the principle that the polluter must pay. Petrol and diesel fuels need to be regarded as harmful commodities, just as tobacco and alcohol are. Internalising environmental costs in prices is an essential requirement. Furthermore a "carrot and stick" approach is needed to constrain the growth in car use by rationing car parking and road user charges; while funding the more sustainable transport modes.

If one of the objectives of tax reform is to change unsustainable transport behaviours then at least a start must be made in integrating tax and environmental policy. The Dutch NEPP versions 1, 2 and 3 are excellent models to study. (An English language version of NEPP 3 is available from PEST).



**Fig 8 Selected OECD Countries 1995: Walking & bicycling
%age modal share of all trips**

Another aspect of encouraging cycling is to reduce the health costs of ageing. Details of the cost savings are set out in the publication of the Cycling Promotion Fund Melbourne (Bauman et al 2008) This publication also describes the barriers, facilitators and interventions needed to get more Australians physically active through cycling,

CONCLUSIONS

There is a serious and urgent risk that high oil prices will eventuate within the next five years and if the price does not go up it will be because the US, EU and Australian toxic debt problem will have created economic depression and reduced the demand for oil. Neither of these consequences were forecast by government agencies. The tax system review panel 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. 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) Taxation could have a significant role in coping with these problems.

In comparison to the Dutch government's actions to reduce greenhouse emissions by the use of tax incentives and constraints and infrastructure provision, the Howard government’s role was fragmented to the point of incoherence. New legislation was introduced in the form of “band aids” for this or that and inevitably failed because the really difficult problems were not addressed because of an ideological commitment to free markets which included an appalling ignorance of the threats of toxic debt. The Howard government did better than the Dutch government and the European and US central bank in regulating toxic debt but the transport and oil consumption trends in Australia show how the market has failed to incorporate the full environmental costs of many human activities and created many perverse economic incentives that has created a dangerously high level of oil dependence.

Railways have been neglected for 30 years. A lot of the rail tracks in use need upgraded and many extensions are needed to the urban rail networks. Railways could triple the use of non-bulk rail freight. In the longer term energy efficient high speed intercity trains are needed to

replace intercity air travel which is totally dependent on liquid fuels.

An important rail passenger transport innovation in Australian capital cities is to increase the interaction of rail passenger transport with other sustainable modes. The growth of bike/rail travel and bike/rail commuting has been constrained by the absence of sustainable, cost effective, vandal and theft proof vehicle parking facilities for bicycles, electric bicycles, light scooters and motor cycles. There are no tax incentives for the above.

The Australian car industry is locked into producing large cars and SUVs and there are no tax incentives to encourage the purchase of small energy efficient cars or to encourage the use of car pooling or the use of car sharing clubs.

Tax recommendations

There is a need to green the Commonwealths tax system to embody the costs of oil depletion into the price of diesel, petrol and aviation fuel and use the funds raised to decouple the growth in oil consumption and greenhouse emissions from the growth of GDP. Provide policy support for tax and other measures by state government and local government agencies and private companies to reduce oil dependence and greenhouse gases. Specifically:

- make better use of the Australian car fleet by providing tax incentives for using CNG as a transitional fuel and the provision of CNG infrastructure at petrol stations.
- provide tax incentives to make better use of the car fleet and by 2012 reduce size of cars in the Australian car fleet.
- provide policy support for the Commonwealth to increase car fleet fuel efficiency by 50% by 2012; by introducing car "fuel efficiency standards so that the average fuel consumption of the car fleet including most 4WD's be 5 litres/100 km and for the 4WDs with truck chassis and light truck fleet to be 6.5 litres/100 km.
- establish the general principle that car travel to and from work is a personal expense Salary packaging for commuting or for vehicles owned by other family members will not be subsidised. Season tickets on public transport and the provision of bicycles for commuting and or on work business should be salary packaged instead.
- provide tax incentives for employers to promote telecommuting, eco-driving, car sharing and car co-ops, reduce subsidised car parking for able bodied drive alone commuters and promote cycling to work.
- provide policy support for the green taxes raised to be used to build bikeway networks in all Australian cities, enhance rail infrastructure, extend rail services and express bus services into all outer urban areas and provide secure bicycle parking at all modal interchanges and railway stations. Fund Travel Smart programs in all urban areas directed to reducing the number of multi car households.
- provide policy support for state planning agencies to provide state tax incentives and constraints on developers to reduce urban sprawl and provide public transport services in new residential and industrial areas and make urban areas more permeable for walkers and cyclists.
- provide policy support for the provision of more short cuts for pedestrians and cyclists; that is more bridges and off road shortcuts through both public and private properties, bridges over barriers, safe mid block main road crossings linking and better route signage and in central areas more roads that are one way for cars but are two way for

pedestrians, cyclists, buses and trams. Plan to make it more convenient to go by bicycle than cars for trips of less than 5 km. and to use bicycles as feeders to the rail system to substitute for long urban car trips .

- provide policy support for the states to change the constitution of road planning agencies to make it their responsibility to reduce the; demand for road space, unsustainable travel,, road congestion and the creation of a continuous arterial bike network within the overall hierarchy of urban roads. Provide bike lanes on main roads and reduce speed limits 50 kph. When there is not room for a bikelane or bike path in the road reserve a safe alternative route would be provided on residential streets with a 40 km per hour speed limit .
- provide policy support for the Commonwealth's climate change and state environmental agencies to change the regulations to allow importing of electric bikes with power outputs of less than 300 watts and to encourage the use of electric bicycles with overnight battery charging. or charging from roof mounted solar photovoltaic cells. This will enable older people to continue cycling much longer.
- provide policy support for the Commonwealth to produce a national Energy Security Policy , to mitigate oil dependency with both demand and supply side measures and to unilaterally reduce oil consumption by 2.2 % per year. This will make a a commitment to freeing Australia from oil dependence by 2020 as is being done in Sweden and Norway.
- obtain a confidential briefing to the Tax System Review Panel from the International Energy Agency about their recommendations for oil conserving transport initiatives that may include tax incentives or constraints to cope with the decline in world oil production ito be published in November 2008 report entitled the "*World Energy Outlook*".

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