



An Alternative National Energy Security Assessment for Australia

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Introduction

An election commitment of the Rudd Labor Government was to develop an assessment of Australia's future energy security. This resulted in the release of the [National Energy Security Assessment](#) (NESA) in March 2009. The liquid fuels section of the NESA was largely based on the findings of ACIL Tasman's [Liquid Fuel Vulnerability Assessment](#) (LFVA).

Given the importance of liquid fuels to both the global and Australian economy, it is reasonable to expect that the Australian Government would provide a realistic appraisal of Australia's future liquid fuels security. Both the LFVA and the NESA fail to address key questions resulting in a liquid fuels security assessment that is overly optimistic. This post will explore the key weaknesses of the NESA and LFVA and propose an alternate, more realistic assessment of Australia's liquid fuels security.

What is energy security?

The Department of Resources Energy & Tourism (RET) defines energy security as the adequate, reliable and affordable supply of energy to support the functioning of the economy and social development, where:

- *Adequacy* is the provision of sufficient energy to support economic and social activity;
- *Reliability* is the provision of energy with minimal disruptions to supply; and
- *Affordability* is the provision of energy at a price which does not adversely impact on the competitiveness of the economy and which supports continued investment in the energy sector.

The NESA further defines the level of energy security using classifications of high, moderate and low levels of energy security. The definitions from the NESA are:

- *Low energy security* is when the economic and social needs of Australia are not, or might not be met.
- *Moderate energy security* is when the economic and social needs of Australia are being met. However, there could be a number of emerging issues that will need to be addressed to maintain this level of security.

- *High energy security* is when the economic and social needs of Australia are being comfortably met.

Australia’s liquid fuels security out to 2023 according to the NESA is shown below:

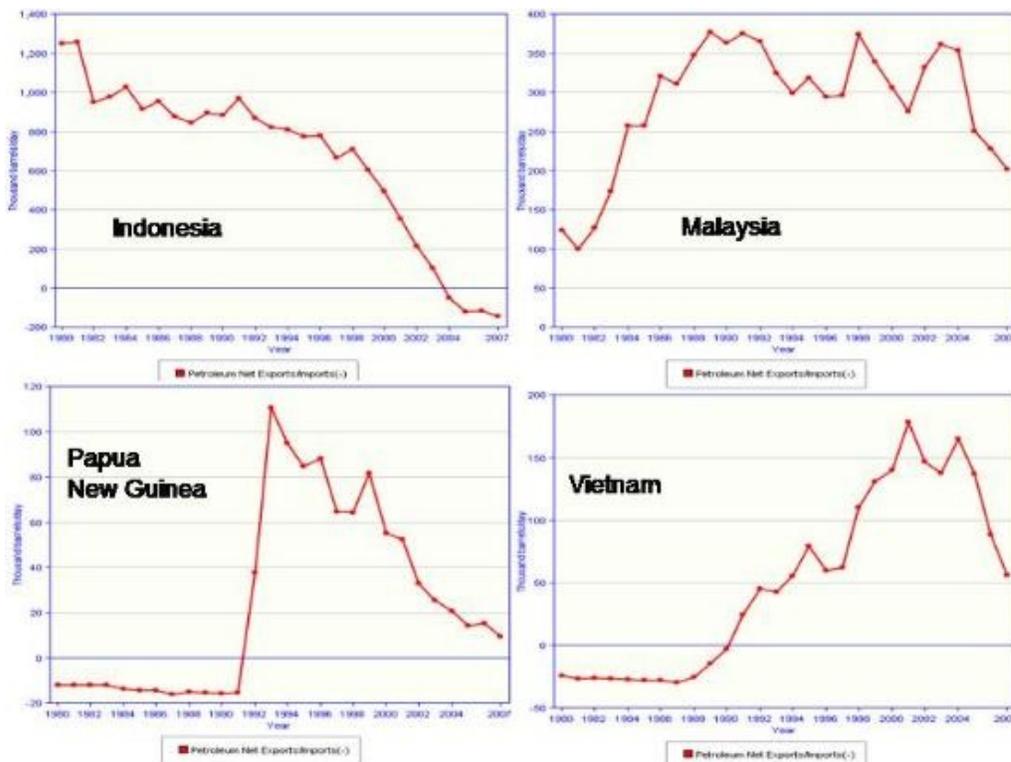
	Current	2013	2018	2023
Adequacy	High	High	High	Moderate
Reliability	High	High	High	Moderate
Affordability	Moderate	Moderate	Moderate	Moderate
Overall	High	High	High	Moderate

As a Government assessment, the NESA will be used by government and business to guide policy and investment. There are a number of weaknesses in the analysis used to develop this assessment that implies that this assessment is unduly optimistic.

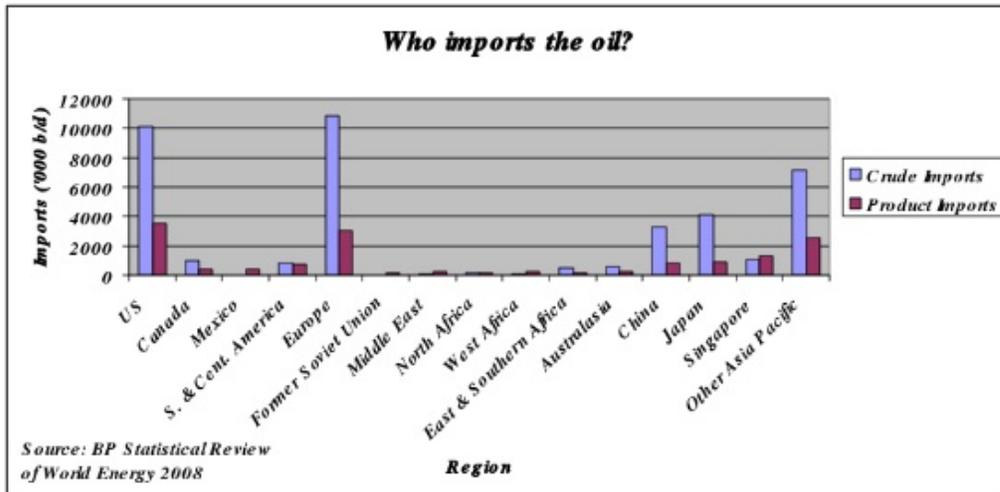
Analysis inadequacies

The NESA acknowledges that Australia’s dependence on oil imports will increase due to declining domestic production and demand growth. What it does not consider however is the status of oil exporting nations nor the geopolitical feedback loops that are likely to impact upon liquid fuels security out to 2023.

As an example, the oil exports from four of the top five countries that Australia imports oil from are in decline, as shown in the following charts, sourced from the US Department of Energy’s Energy Information Administration ([EIA](http://www.eia.doe.gov)).



The exports of these nations are likely to continue to decline as they are post peak domestic oil production and their domestic consumption is increasing. The oil wealth generated through oil exports encourages increased domestic consumption but at the same time reduces the oil available for export. This situation is replicated amongst many of the world's oil exporting nations. Based on EIA data, it appears that oil exports from the world's top 15 oil exporters, who provide over 90% of world oil exports may have peaked in 2005. If world oil exports are in a terminal decline and demand for oil imports increases, clearly there is going to be an issue with sourcing Australia's oil import requirements. Both the LFVA and NESAs avoid this significant problem by stating that the diversification of oil supply sources is important without identifying that in all likelihood, all oil importers will also be attempting to diversify nor examining the issues surrounding diversification such as an increased length in the supply chain. The competition for oil exports will be intense and leads to the next issue: geopolitics.



The competition: Australia is a minor player in the oil import game. The competition will be intense to 'diversify' supply

The NESAs states that the 'longer term outlook for liquid fuel security will see increasing reliance on difficult geographic and geopolitical regions. This may result in price volatility.' Whilst price volatility is of concern, this statement significantly understates the potential for geopolitical problems resulting from dependence on oil imports. Former US Air Force Intelligence Officer, [Jeff Vail](#), has identified a number of geo-political feedback loops that are likely to exacerbate the problem of declining oil exports.

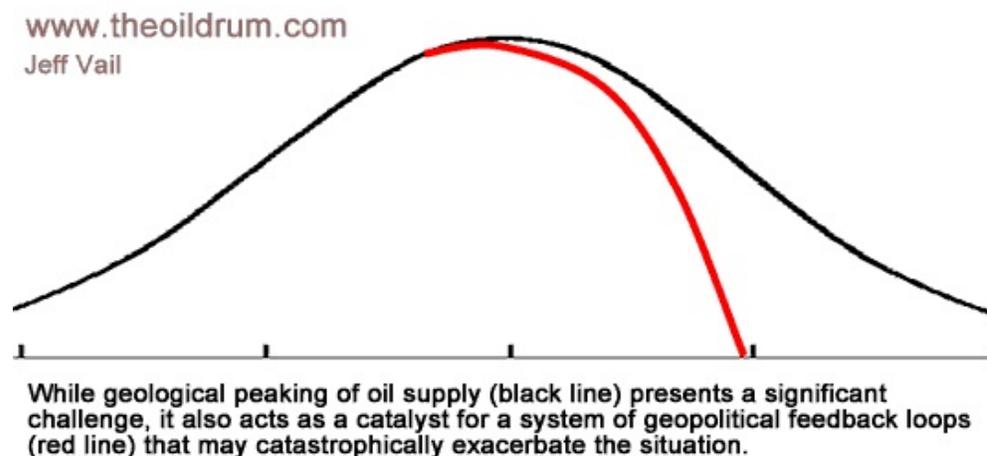


Image Source: <http://www.theoil Drum.com/node/4373>

While geological peaking presents a significant challenge (black line = geologically determined oil production rate), it also acts as a catalyst for a system of geopolitical feedback loops that may catastrophically exacerbate the situation (red line = potential impact of accelerating geopolitical feedback loops on oil production rate).

A summary of the major feedback loops are:

Return on Investment: Increased scarcity of energy, as well as increased prices, increase the return on investment for attacks that target energy infrastructure. There are a number of countries where attacks on oil associated infrastructure are already an issue, such as Nigeria, Iraq, Yemen and Mexico. For [example](#), a 2007 attack on natural gas pipelines in Mexico was estimated to have a return on investment of 1.4 million per cent.

Mercantilism: As the availability of oil exports becomes increasingly problematic, some nations will want to guarantee sources of supply through long term supply deals. China is particularly aggressive in this regards, signing recent deals with [Brazil](#) and [Russia](#) to secure long term oil supplies and investing in many [energy companies](#) around the world (not to mention Chinese investment in Australian [resources](#) are of course another area that the Chinese are investing heavily in). Energy mercantilism will further reduce the amount of oil available for other oil importing nations and thus encourage other countries to lock up long term supplies or potentially turn to military adventurism to secure supplies.

Nationalism: The nation state system in many countries lays the foundations for another feedback loop. As an example, [Nigeria](#) is a forced amalgamation of over 250 distinct ethnic groups and numerous religions. Nigeria's oilfields however are only found in a small number of these states. This poses a difficult problem. Nigeria as a nation state has an ownership claim on the oil reserves within its borders, but so do the ethnic groups who have habitually resided in the areas of the oil reserves. Throw in corruption and unequal distribution of oil wealth and the situation is ripe for internal conflict. This is exactly what has occurred in Nigeria where the Movement for the Emancipation of the Niger Delta (MEND) has significantly reduced Nigerian oil exports as they attack oil infrastructure to further their political objectives. Iran, Iraq and Bolivia are other nations with similar concerns. As oil exports decline and thus the wealth from oil exports decline, this problem will become more prevalent.

These feedback loops will reinforce each other and impact globally. For example, it appears that Mexico will be the next major oil exporter that will become a [net importer](#). This will increase the scarcity of oil exports around the world and thus increase both the likelihood and impact of the other feedback loops. Whilst it is very difficult to forecast exactly how these geopolitical feedback loops will impact upon Australia's liquid fuel security, it is reasonable to expect that at some point during the forecast period, that declining oil exports combined with the geopolitical feedback loops that have been outlined will have a negative impact on the adequacy and reliability of Australia's oil supply. There is another feedback loop however that deserves a section on its own, and that is investment in the oil industry.

Investment

The most topical feedback loop is the impact on investments in the oil industry. The International Energy Agencies (IEA) World Energy Outlook 2008, released in November 2008, stated that there is a 'real risk that under-investment will cause an oil-supply crunch' in the period to 2015. This warning was prior to the full impact of the global financial crisis. A recent [report](#) from the IEA suggests that global energy sector investment will fall by 21% in 2009 with as much as \$170 billion worth of oil projects, the equivalent of 6.2 million barrels a day or around 8% of current world oil production, being cancelled or delayed in recent months. The fall in oil prices since July 2008 and the subsequent credit crunch have put at risk of deferment or cancellation more than half of the expected growth in oil production capacity over the next five years according to [Daniel](#)

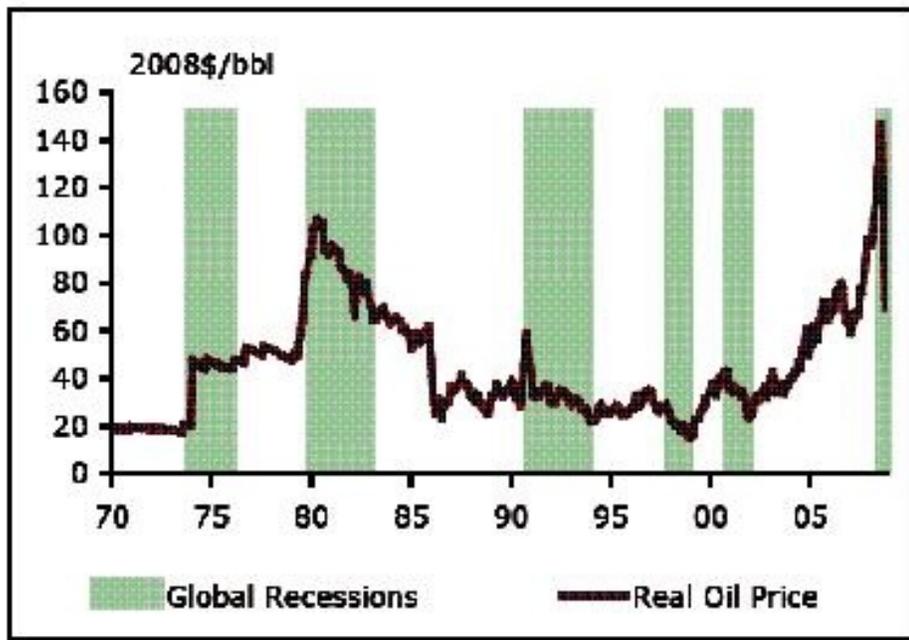
[Yergin](#), Chairman of Cambridge Energy Research Associates. [The Economist](#) warns that this lack of investment will result in another oil price spike when global demand for oil increases.

Whilst not the sole cause of the global financial crisis there are a number of economists, such as Jeff Rubin, former Chief Economist at Canadian Imperial Banking Corporation's World Markets and [Dr James Hamilton](#) who argue that the oil price increases of 2005 – 2008 were a major factor in the current financial crisis. For example, Rubin [states](#) that:

The oil price rises, and the economy stalls. The demand for oil then drops sharply, and the oil price falls. Consumers and producers alike heave a sigh of relief and get back to work until the next spike. But notice this: the prices always ratchet upward. In 2000, when Rubin predicted \$50 oil, a \$30 price was considered high. Just eight years later, we regard \$50 oil as cheap.

Rubin's research also suggests that there is a [link](#) between oil price spikes and global economic recessions as shown in chart one.

Chart 1
Past Recessions and Oil Spikes



This investment feedback loop suggests that a lower oil price, resulting (at least in part) from economic recession triggered by high oil prices will lead to falling investments and therefore increase the likelihood of future scarcity of oil and price spikes. The NESAs acknowledges that there is an investment risk of a supply side crunch due to inadequate investment; however it is not until 2018 that this is seen as a concern. Current events however would indicate that this supply crunch is likely to occur much sooner. Treasury expects [economic growth](#) of 4.5% in 2011-12 as our economy recovers from the global financial crisis. This will likely be about the same timeframe that an oil supply crunch will occur. If the link between oil price spikes and economic recession holds, then it is hard to see how this recovery will be possible. This in turn raises the question of how the Government will pay off its debt.

A more realistic liquid fuels security assessment

The real weaknesses of both the NESAs and the LFVA are not the analysis themselves but the questions that are not asked and hence not answered. Considering these key questions, namely

declining oil exports, geo-political feedback loops and the investment outlook provides the opportunity to make a more realistic appraisal of Australia’s liquid fuel security as detailed below:

	Current	2013	2018	2023
Adequacy	High	Moderate	Low	Low
Reliability	High	Moderate	Moderate	Low
Affordability	Moderate	Low	Low	Low
Overall	High	Moderate	Low	Low

A realistic appraisal of Australia’s liquid fuel security

- **Adequacy:** The assessment of the adequacy of Australia’s future oil supply is based upon this [model](#) which suggests that Australia’s fuel supply could fall short of projected demand by over two thirds by 2025.
- **Reliability:** This assessment is made based upon the increasing impact of geopolitical feedback loops over time and the requirement to increase the length of our oil supply chain as we increase the percentage of supply sourced from areas outside of our region.
- **Affordability:** Oil prices are likely to remain volatile over the longer term however the overall trend will be up due to increased demand and declining oil availability.

Why is this important?

Australia and the world appear to have three big and conflicting investment requirements. It is highly improbable that there is sufficient investment available to meet the demands of all three. The requirements are:

- Maintaining the production capacity of our fossil fuel energy sources.
- Developing a renewable energy economy to replace fossil fuels as reserves deplete and to minimise the impacts of climate change.
- Respond to the global financial crisis.

Currently, it appears that governments around the world are focusing on the third and least important requirement through financial stimulus packages. Unfortunately this short sighted approach is aimed at maintaining ‘business as usual’ (BAU) and is a consequence of governments around the world failing to address the issue of oil depletion. The long term consequence is that there will be insufficient investment in both fossil fuel and renewable energy and is in fact the worst case scenario. It will result in further economic hardship from future oil shocks and increase the likelihood of dangerous climate change whilst not providing an alternate energy system. In effect, by trying to maintain BAU our government is actually reducing the likelihood that something like BAU can be maintained.

Of course, it does not have to be this way. A realistic appraisal of Australia’s liquid fuel security would encourage policies focused on significant growth in renewable energy, energy efficiency, rail and mass public transportation. An approach such as this seems to offer the best chance of reducing oil dependency, reducing the impact of oil shocks, addressing climate change, maintaining a level of economic prosperity and creating employment. However this requires a significant change in direction by Government. According to the [IEA](#) only 5% of global stimulus

packages to date have been focused on energy efficiency and clean energy. The IEA warns that the level of new funds allocated to energy efficiency and clean energy should be four times current levels and be sustained each and every year for the next few decades. According to the IEA, such an approach would kill three birds with the one stone, tackling climate change, enhancing energy security and combating the recession.

Conclusion

On the face of it, both the NESAs and LFVAs appear to be a comprehensive analysis of Australia's liquid fuel security situation. However both reports ignore or avoid the critical issues that will impact upon Australia's future liquid fuel supply. This results in an inappropriate assessment of Australia's liquid fuel security. The unfortunate consequence is that Australia is likely to face significant economic and social hardship over the next few decades as our liquid fuel security declines. The really disappointing aspect is that much of this hardship could be avoided through a realistic liquid fuel security assessment and appropriate policy responses. This poses the interesting question of why have these issues been avoided?



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