

# Government refuses to address Australia's future liquid fuel risks

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*\$90 billion for submarines that may never be used in conflict. Only \$200 million for Future Fuels that every Australian depends upon every day. There is something seriously awry with the Government's priorities.*

That Australia needs a future fuels strategy is patently obvious. Australia's growing dependence on imported oil is extremely problematic (see [here](#), [here](#) and [here](#)) whilst there is also the climate imperative to reduce emissions. To put it bluntly, Australia's current predominantly oil-fuelled transportation system is unsustainable.

The Commonwealth Government has recently released a [Discussion Paper](#) on its Future Fuels Strategy. It is perhaps reasonable to expect that such a strategy may seek to reduce Australia's oil consumption, improve fuel security and reduce emissions in a timely fashion. The current strategy, even if successful in meeting the vague and ill-defined objectives contained therein, is unlikely to achieve any of these imperatives. Two words can describe the proposed strategy: woefully inadequate!

It is now apparent, based on the Future Fuels Strategy and other documents such as the Interim Liquid Fuels Security [Report](#), that the Commonwealth Government has little understanding of the liquid fuel predicament that Australia faces. A predicament perhaps best described by [Dr Simon Michaux](#):

*"We think we are going to replace a complex industrial ecosystem that took more than a century to build with the support of the highest calorifically dense source of energy the world has ever known (oil) in cheap abundant quantities, with easily available credit, and unlimited mineral resources.*

*At a time when we have very expensive energy, a fragile finance system saturated in debt, not enough minerals, and an unprecedented human population, embedded in a deteriorating environment."*

The strategy appears to be based upon an underlying myopic assumption that market forces will enable a seamless transition from oil-fuelled transport to a range of alternative fuels and propulsion systems with the Government's involvement being limited to a relatively small 'priming the pump' investment.

Even a cursory examination of the urgency, scope and scale of Australia's liquid fuel predicament suggests that such an assumption misses the mark by a wide margin. For example, in arguably the most thorough [investigation](#) to date outlining the actions required to mitigate declining oil production, the authors concluded that mitigation actions will require *significant government intervention* over a prolonged timeframe to

avoid *chaotic economic and social implications*. Without such intervention, the market will manage supply shortages through widescale demand destruction (i.e. recession, rising unemployment and business failures).

It appears that Future Fuels Strategy has been developed without a feasibility study into a largescale transition to alternative fuels and propulsion systems. A growing body of scientific literature suggests that there are insufficient reserves for many of the key minerals required for a large-scale transition to Renewable Energy and Electric Vehicles.

For example, Watari et al. found that the Total Material Requirement (TMR) flows for the global transition increase by around 200–900% for the electricity sector and 350-700% for the transport sector. This is largely due to the increased demand for copper, silver, nickel, lithium, cobalt and steel. They also found that whilst decarbonising the electricity sector can reduce energy resource flows (i.e. reduced use of coal) this could be offset by the increased TMR flows associated with widescale EV adoption.

Valero et al. examined material bottlenecks for the development of green technologies. They found multiple metals (tellurium, silver, cadmium, cobalt, chromium, copper, gallium, indium, lithium, manganese, nickel, tin and zinc) are at a high risk of a supply bottleneck (defined as cumulative demand surpassing current reserves) out to 2050.

Ore grades are declining for virtually all minerals required for the global RE/EV transition. This has enormous ramifications for the energy and water demand for mining operations. Henckens & Worrell concluded that the energy required for copper production may increase from the current 0.3% to 2.4% of total global energy demand by 2050! Whilst Elshkaki et al. estimated that two to three times as much energy will be required to meet nickel demand by 2050 with a corresponding 1.5 to 2.5 increase in water demand.

These and other studies make it difficult to avoid the conclusion that there will be major constraints limiting both the speed and scope of the global energy ‘transition’ to the extent that it is possible. The surging price for many of the commodities required for the transition is an indicator that these constraints are a near term concern.

Over the next decade, based on current trends, around 30 million barrels a day of oil production (nearly a third of global oil production) will be lost to depletion. With investment levels in the oil industry needing to double or more just to maintain current production levels, it seems likely that a large chunk of this production will not be replaced. Clearly, this indicates an urgent requirement to implement a future fuels strategy with well-defined objectives and timelines. These are entirely missing in the Strategy which at this late stage is focused on trials, roadmaps and ‘coordinating’ investment, suggesting that even a successful implementation of the Strategy will not markedly improve Australia’s fuel security for a decade or more. A case of too little too late.

Whilst there is much to criticise in the current Strategy, there are two changes that could be made which would be of great benefit.

The first is to change the focus away from car-based EVs for passenger transport. On a battery mass per passenger basis, car-based EVs are an extremely inefficient use of the limited minerals available to electrify the vehicle fleet. Even a small car such as the Nissan Leaf requires 60 kilograms of battery per passenger, compared to an e-bus at around 30 or an e-bike at four kilograms per passenger. Prioritising e-buses, e-bikes and e-scooters over e-cars would have numerous benefits. These include reduced recharging infrastructure requirements, a more rapid and greater extent of penetration than possible with e-cars, greater equity and enhanced fuel security.

The second change is to prioritise heavy and commercial vehicles or alternatives thereto over passenger transport. Diesel is what runs this country, from mining to agriculture and the distribution of goods. It is also one of the most challenging fuels to replace. Whilst physical shortages of petrol would be disruptive to the economy, shortages of diesel would be catastrophic.

Given the challenges facing long-distance transport, much of the focus should be on minimizing the requirement to move goods, such as food, over long distances. Australia's agricultural supply chains generally extend for thousands of kilometres. The localisation of food production and distribution will be critical to building resilience in a liquid fuel constrained future.

The Commonwealth Government is planning to spend \$90 billion on submarines. Submarines that may never be used in conflict, and in the event of a major war, are unlikely to change the outcome. Yet only a measly \$200 million is allocated for something as important as powering/fuelling the nation's future transportation system which we all depend upon every day in perpetuity. Clearly, there is an issue with the Government's priorities.

The by-line of the Future Fuels Strategy is titled 'Powering Choice.' However, at this late-stage Australia's liquid fuel predicament indicates that as a country our choices are quite limited and will become even more limited over time. Urgent and decisive action is required now to minimise the potentially pandemic-level or worse disruptions of a liquid fuel constrained future, something which is entirely missing from the current version of the strategy. Much more is required in the Future Fuels Strategy. More realism, more investment, more ambition, more urgency and more imagination. Let us hope that much more is incorporated in the final version of the Strategy.