Addendum B to
Submission (#09) to the Australian Parliament Senate Select Committee into
Fair Dinkum Power

Falling conventional crude oil production impeding diesel supply

Global production of conventional crude oil reached its peak in 2008, at 69.5 million barrels per day (Mb/d) and has since fallen by approximately 2.5 Mb/d, with an additional 3 Mb/d fall expected between 2017 and 2040. The level of conventional resources approved to be developed in recent years is well below the demand requirements in the International Energy Agency's (IEA's) New Policies scenario, creating the risk of a tension in the market in the 2020s.[1]

An increasing proportion of global crude oil production is originating from "unconventional oils", light oils that are generally bad substitutes not suitable to produce diesel and marine bunker fuels. The relatively light density of US shale oil is unsuitable for making several of the heavier oil products such as diesel and jet fuel unless it is blended with heavier imported crude.[2] The US refining system is close to being "maxed-out" on the amount of shale oil it can process, ill-suited for producing higher octane gasoline, jet fuel and diesel.[3]

As global conventional crude oil production falls further, global petroleum-based diesel and marine bunker fuel production will likely decline too.

IMO 2020 rule may intensify diesel shortages & escalate fuel prices

A new International Maritime Organization (IMO) rule comes into effect on January 1, 2020. The new IMO 2020 rule requires all oceangoing ships to use low-sulphur diesel fuel.[4] Until now, ships have burned "the dregs" of crude oil, relatively high in sulphur and other pollutants, because it was the least expensive fuel available.

Ships made globalisation possible and play an essential role in our high standard of living, carrying 90% of global goods traded.

Some energy analysts suggest **the world's petroleum industry lacks the capacity needed to supply additional low-sulphur fuels to the shipping industry while simultaneously meeting the requirements of existing customers such as farmers, truckers, rail locomotive and heavy equipment operators.**[5]

In 2020, it's likely crude oil prices will rise, sending all petroleum fuel product prices higher. Diesel prices will lead, but gasoline and jet fuel will follow.[6]

---

[1] IEA's ***World Energy Outlook 2018***, p45, https://www.iea.org/weo2018/

[2] **Peak Oil Review: 29th October 2018**, edited by Tom Whipple and Steve Andrews, http://peak-oil.org/peak-oil-review-29-oct-2018/

[3] *DeSmogBlog*, **Low Octane: The Surprising Reason Shale Oil Makes a Poor Fuel for High-Tech Cars and Trucks**, by Sharon Kelly, 24 Apr 2018, https://www.desmogblog.com/2018/04/24/octane-surprising-reason-shale-oil-makes-poor-fuel-high-tech-cars-and-trucks

[4] IMO, **Frequently Asked Questions: The 2020 global sulphur limit**, http://www.imo.org/en/MediaCentre/HotTopics/GHG/Documents/2020%20sulphur%20limit%20FAQ%202019.pdf

[5] *Reuters*, **Maritime rule change stirs fears of diesel shortage: Kemp**, by John Kemp, 26 Oct 2018, https://www.reuters.com/article/us-oil-prices-kemp/maritime-rule-change-stirs-fears-of-diesel-shortage-kemp-idUSKCN1MZ2EM?fbclid=IwAR2OFDr6EoYyxuLEl2qIk08aczFS-GmlE-6bMP-O7Xy5ztFhnfUQheUW3Ds

[6] ***$200 Crude, the Economic Crisis of 2020, and Policies to Prevent Catastrophe***, by Philip K. Verleger, Jr., Jul 2018, https://www.pkverlegerllc.com/assets/documents/180704200CrudePaper.pdf

High petroleum fuel product prices will have two impacts. Firstly, prices of nearly everything consumed in the economy will rise. Secondly, high prices will force consumers to spend less on discretionary goods and services, which will depress demand for airline travel, restaurant dining, and new internal-combustion engine vehicles, to mention a few likely examples. Rising fuel costs in the agricultural sector will lead to higher food prices.

From now on, what can be expected is a real and sustained persecution against internal-combustion engine vehicles – diesel-powered vehicles first, then probably followed by gasoline a few years later.

To avoid an energy supply crisis a rapid transition away from petroleum fuel dependency is now imperative. 'Fair Dinkum Power' must take up the energy supply slack as the transition from petroleum-based fuels to renewable energy alternatives progresses – there's no time to waste.

World's largest conventional oil field produces much less oil

Ghawar in Saudi Arabia, the world's largest conventional oil field, produces a lot less oil than almost anyone previously believed.

Saudi Aramco recently published its first ever profit figures since its nationalisation nearly 40 years ago, lifting the veil of secrecy around its mega oil fields.[7] Aramco's bond prospectus has revealed that **Ghawar is able to pump a maximum of 3.8 Mb/d** – significantly below the more than 5 Mb/d that had become conventional wisdom in the market.

The prospectus offered no information about why Ghawar can produce today a quarter less than 15 years ago - a significant reduction for any oil field. The report also didn't say whether capacity would continue to decline at a similar rate in the future.

Aramco also disclosed reserves at its top-five fields, revealing that some of them have shorter lifespans than previously thought.

In total, the Saudi kingdom has 226 billion barrels of reserves, enough for another 52 years of production at the maximum capacity of 12 Mb/d.[8]

BP Statistical Review of World Energy 2018 indicates that Saudi Arabia (the world's second largest crude oil producer) at the end of 2017 had an **estimated Reserves-to-Production (R/P) at 11.951 Mb/d of 61.0 years.**[9] **It seems the latest data indicates the world now has significantly less petroleum oil reserves remaining than conventional wisdom previously estimated.**

---

[7] *SMH*, **Saudi Aramco was the world's most profitable company in 2018**, from Bloomberg, 1 Apr 2019, https://www.smh.com.au/business/companies/saudi-aramco-was-the-world-s-most-profitable-company-in-2018-20190401-p519nx.html

[8] *SMH*, **Saudi mystery: World' s largest oil field is fading faster than anyone knew**, by Javier Blas / *AP*, 3 Apr 2019, https://www.smh.com.au/business/markets/saudi-mystery-world-s-largest-oil-field-is-fading-faster-than-anyone-knew-20190403-p51a6m.html

[9] pp12, 14, https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2018-full-report.pdf

Addendum B to
Submission (#09) to the Australian Parliament Senate Select Committee into
Fair Dinkum Power

Port Augusta's CSP project scrapped, failing to secure finance

A $650 million, 150 MW with 8 hours energy storage concentrating solar power (CSP) plant planned for Port Augusta will now not go ahead due to the company behind it, SolarReserve, failing to secure adequate commercial finance for the project before the May 31 deadline set by the South Australia (SA) Government.

Earlier in 2017, the Australian Federal Government confirmed it would grant $100 million in a concessional equity loan to support the project.[10]

Despite having everything else in place – approvals, contractors, off-takes, and even MOUs with mining groups such as Oz Minerals – it has proved too difficult to convince financiers.

Overseas, CSP plants are progressing. SolarReserve is building one plant in South Africa and has a contract for another, as well as other plans for more ambitious projects in Chile and the United States.[11]

SA's Opposition Leader, Peter Malinauskas, blamed the scrapping of the CSP project on the SA State Government's plan for a $1.52 billion interconnector to New South Wales (NSW), due to be completed by 2022.

NSW's 2000 MW Liddell coal-fired power station is scheduled to close in 2022.

NSW has no comprehensive policy or target to encourage new renewable energy generation and it also has no policies in place to push towards reaching its net zero emissions by 2050.[12] It is unlikely that the market will adequately produce NSW's new electricity supply in a timely fashion or at better prices.[13]

Rather than SA becoming more self-sufficient with zero-carbon emissions, 'dispatchable' electricity supplies, the SA Government is now apparently depending upon "an extension cord to NSW" that may not have the surplus capacity to supply at critical times.

Although more strategically placed interconnectors are critical for a robust Australian national electricity network, so is more 'dispatchable' generating capacity to replace Australia's ageing and increasingly less reliable coal-fired generators.

The consequences of poor energy planning continue to play out with an increasing risk of energy disruptions/shortages and higher prices.

---

[10] *ABC News*, **Port Augusta solar thermal power plant scrapped after failing to secure finance**, 5 Apr 2019, https://www.abc.net.au/news/2019-04-05/solar-thermal-plant-will-not-go-ahead-in-port-augusta/10973948

[11] *RenewEconomy*, **SolarReserve abandons huge solar tower and storage plant near Port Augusta**, by Giles Parkinson, 4 Apr 2019, https://reneweconomy.com.au/solarreserve-abandons-huge-solar-tower-and-storage-plant-near-port-augusta-93885/

[12] *RenewEconomy*, **New South Wales energy sector is "ageing and unprepared"**, 27 Feb 2019, https://reneweconomy.com.au/new-south-wales-energy-sector-is-ageing-and-unprepared-73527/

[13] *RenewEconomy*, **Will the NSW election deliver a change in electricity policy?**, by David Leitch, 19 Mar 2019, https://reneweconomy.com.au/will-the-nsw-election-deliver-a-change-in-electricity-policy-48376/