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Submission: Interim Report on the Liquid Fuel Security Review

The Interim Report outlines significant risks to Australia's transport energy security. Addressing these security risks requires reducing oil consumption and accelerating the transition to electric vehicles

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Summary

The Department of the Environment and Energy is conducting a Liquid Fuel Security review and public consultations on the Interim Report. This report is an edited version of The Australia Institute's submission to that consultation.

The *Interim Report on Liquid Fuel Security* shows Australia is ill-equipped to deal with a liquid fuel security crisis. In FY2018 Australia had on average access to liquid fuel that would cover only 20 days of consumption. Alarmingly, the Interim Report reveals the emergency powers to ration fuel stocks would take up to three weeks to be implemented in the event of a fuel emergency.

The Interim Report makes it clear that producing more oil in Australia is a dubious response to the issue of fuel security. Australia's oil production has already peaked and is likely to continue to decline. There is great uncertainty surrounding the scale, quality and viability of oil production in prospective resources like the Great Australian Bight and Beetaloo Basin.

Reducing oil use requires both increased fuel efficiency and substitution to non-oil based transport, including active transport, public transport, and electric passenger vehicles.

The Australia Institute strongly supports a review of the *LFE Act*, as announced by the Minister for Energy. The Review should refocus away from liquid fuel and towards transport, and ensure its scenarios integrate Paris-consistent emissions targets. The Department's ongoing work in this area should include scenarios consistent with Australia's commitment under the Paris Agreement to consider increasing targets consistent with a 2 degree budget.

In developing the final Review and relevant scenarios, the Department should ensure it consults with industries required to drive this transition and includes policies with specific electric vehicle targets and fuel efficiency standards.

Introduction

The Australia Institute is a public policy research organisation based in Canberra. Our dedicated Climate and Energy program conducts a range of research into issues, including energy and emissions relating to transport. The Australia Institute welcomed the opportunity to respond to the *Interim Report on the Liquid Fuel Security Review* ("Interim Report").[1]

The Review is framed in terms of security of *liquid fuel*. This framing is misplaced and inconsistent with much of the content of the Interim Report. The Department's concern should not be security of fuel for its own sake, but security of energy services. Liquid fuel consumption in Australia is dominated by transport, with smaller roles for peaking electricity and non-energy uses. It would be more appropriate to approach the issue from a broader perspective of energy security, and specifically for transport. As the Interim Report itself emphasises, there is a great need to increase fuel efficiency and transition to non-oil energy sources.

The Interim Report outlines significant risks to Australia's transport energy security, due to reliance on imported oil and access to only a limited number of days of consumption at any one time. The Interim Report shows that in a major security situation fuel stocks could be greatly eroded before emergency powers come into force. Importantly, the Interim Report doubts new domestic oil supply will ameliorate those risks. Rather, it emphasises the need to reduce consumption and diversify sources of energy.

These significant findings are strongly endorsed and extended in this report. Reducing oil dependency is imperative for energy security, national security and climate change mitigation.

[1] Department of Energy (2019) *Liquid Fuel Security Review* https://www.energy.gov.au/government-priorities/energy-security/energy-security-assessments/liquid-fuel-security-review ("Interim Report")

Strategic risk

As highlighted by the Interim Report, the Australian economy is currently highly dependent on imported liquid fuel:[2]

- 90 per cent of the fuel consumed in Australia is derived from oil sourced outside of Australia.
- Australia imports 60 per cent of its refined oil.
- Of the crude oil refined in Australia, 80 per cent is imported.

Further, Australia is in breach of international obligations regarding fuel stocks. Even more concerning is that these stocks leave Australia with access at any one time to only a limited number of days' worth of consumption.

In 2017-2018 Australia had an average of only 20 days of consumption cover of refined fuel.[3] This means if all oil supply into Australia's supply chains were to cease immediately, consumption at current rates would continue for only 20 days on average across fuel types.

Of course consumption cover figures are only a guide for risks of more complex system disruptions.[4] It is nonetheless clear that the consequences of any significant impact on oil supply could be substantial to both the Australian economy and security.

Such disruptions could have many causes, which could be concurrent and interacting, and the risk is fuelled by increasing climate extremes. There could be a range of strategic implications, for example, on supply chains for all essential goods, like food.

In this context it is useful to highlight recent regional supply disruptions.

- In late 2012, Shell's Geelong oil refinery suffered system failures, stopping production of 50 percent of Victoria's diesel supply. Diesel supplies ran out for two days in North West Victoria, in the middle of harvest period for farmers.[5]
- In May 2014, issues with imported diesel led to a shortage across the Perth Metropolitan area. BP confirmed an acute supply shortage, diesel was unavailable at more than 100 service stations across Perth and regions, and the WA Department of

[2] Interim Report, p 3.

[3] Ibid p 47.

[4] Such a disruption would likely impact demand, and supply is more likely limited than completely cut off. Conversely, there could be panic buying, hoarding, increased demand from addressing the disruption itself (e.g. natural disaster, defence requirements), or other countervailing factors.

[5] NRMA (Prepared by John Blackburn AO) (2013) *Australia's Liquid Fuel Security Part 2,* https://www.aph.gov.au/DocumentStore.ashx?id=677ff8dd-ce35-40ee-9af8-bfec1e43d125&subId=301736 p 12

Mines Industry Regulation and Safety advised drivers not to drive without checking ahead of a trip to see if fuel was available. [6]

These events occurred even with the availability of the broader supply chain. While short term, they are likely to have had significant economic impacts.

EMERGENCY POWERS INADEQUATE

Given the strategic risks outlined above, it is highly concerning to learn from the Interim Report that emergency powers to ration fuel stocks, under the *Liquid Fuel Emergency Act 1984* ("the *LFE Act*"), would take up to three weeks to be implemented.

The long time period for implementing the rationing and direction powers exhausts much of and potentially all of the total consumption coverage.

There are also risks of panic buying and hoarding in the intervening period, reducing stocks available for rationing.

During Senate Estimates, a Departmental official stated that such a disruption could be viewed in advance, giving increased lead time. This seems a poor basis for strategic planning, given the uncertain nature of disruptions.

Clearly, the current arrangements are leaving Australia ill-equipped to deal with a liquid fuel security crisis.

This economic and strategic risk is emblematic of how poorly successive governments have managed the issue of transport energy security in Australia.

The Australia Institute strongly support a review of the *LFE Act*, as announced by the Minister for Energy. The review of the emergency response should be informed by longer-term changes needed to increase energy security.

[6] BP (2014) *BP confirms WA diesel supply,* https://www.bp.com/en_au/australia/media/media-releases/bp-confirms-wa-diesel-supply.html
WA Department of Mines Industry Regulation and Safety (2014) *Diesel buying advice for WA drivers,* https://www.commerce.wa.gov.au/announcements/diesel-buying-advice-wa-drivers

New domestic supply a dubious response

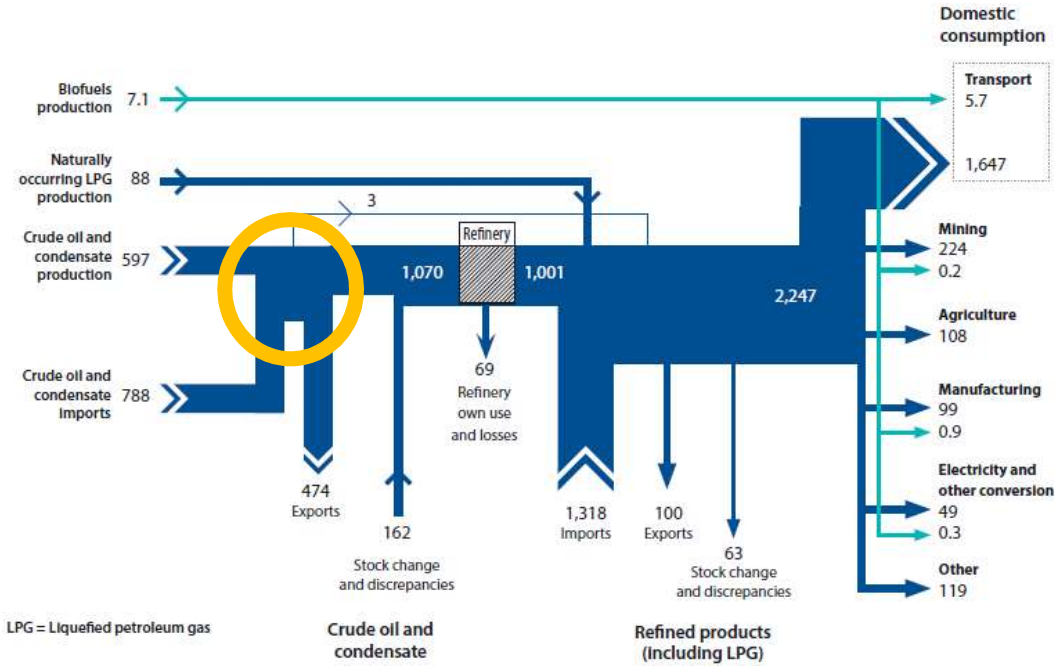
If Australia's transport energy security is threatened by reliance on imported oil, the question arises as to whether it is possible to increase Australia's consumption of domestic oil.

The Interim Report makes it clear that producing more oil in Australia is a dubious response to this issue.

Australia produces some oil domestically, but most of this is exported, while most refinery feedstocks are imported. This is because of a mismatch between the type of product extracted, the design of Australian refineries and Australian demand.

This fact should be made more clearly in the final report. Figure 1 (reproduced below) shows annual flow of Australian liquid fuel. However, as highlighted with an orange circle, the figure fails to show that most primary production is exported, and most input into Australian refineries is imported.

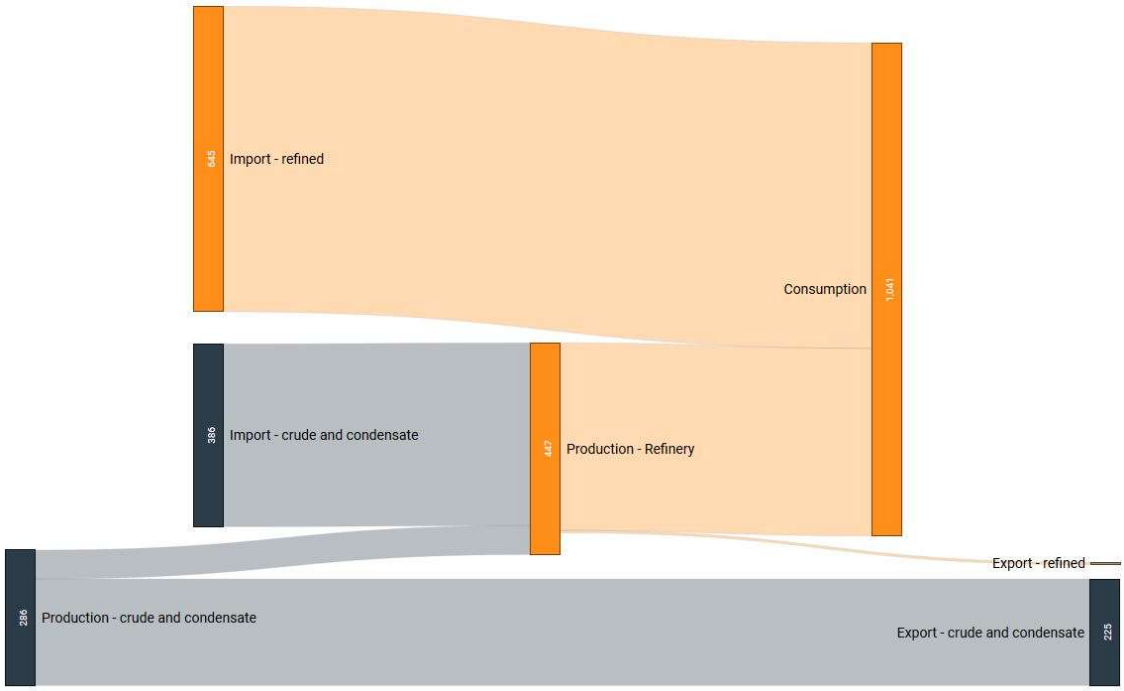
Figure 1: Australian liquid fuel flows, petajoules, 2016-7



Source: Liquid Fuel Security Review, p 6, figure 1, amended by TAI

Figure 1 obscures the extent of Australia's dependency on imports by hiding the tiny share of domestic demand met by domestic production. Figure 2 (below) presents liquid fuel flows using data from the Office of the Chief Economist's *Resource and Energy Quarterly.* Domestic primary oil production is a very small share of consumption, even if all non-exported primary oil production is refined and consumed domestically, as assumed in the diagram.[7]

Figure 2: Australian liquid fuel flows, kb/d, 2017-8



Source: The Australia Institute's figure using data from Office of the Chief Economist (2019) *Resource and Energy Quarterly March 2018*

The Interim Report gives many further reasons to think domestic supply is a dubious response to transport energy security risks.

- Australia's oil production is likely to continue to decline. It is already far below its 2000 peak, which was 59% higher than current production.
- There is great uncertainty surrounding the viability of oil production in prospective resources like the Great Australian Bight and Beetaloo Basin. Such projects may not be commercial. They may rely on significant subsidies, which would be better directed to other energy security measures.
- The Interim Report notes the scale and viability of oil production in the Bight is largely unknown. It cites industry consultants who put it at "between 15 and 40 per cent of [Australian] demand for 20 years", not coming into full production "until

[7] Assumptions include that production of primary oil is either

after 2030 given the complexity of infrastructure installation."[8] The Interim Report also states global oil demand is expected to peak in the 2030s.[9]

It is also important to point out:

- Oil produced in these projects may not be compatible with Australian refineries and demand requirements. Oil industry representatives, in whose interests it is to justify such claims, have been unable to provide evidence that new Australian oil production will be refined, or refinable, in Australia. The Minister for Resources has also been unable to provide such evidence.
- The social license for fracked shale oil in the Northern Territory or for drilling in the Great Australian Bight is at best contentious, and likely to erode further. Public opinion research has found strong opposition across the country to allowing drilling for oil in the Bight,[10] and strong opposition in the NT for fracking for gas.[11]

Even if domestic supply is increased, declining refinery capacity and resilience increases reliance on imports. The Report casts doubts on the viability of Australian oil refineries:

- Remaining Australian oil refineries are shutting down. The Port Stanvac refinery closed in 2003. The Clyde refinery closed its doors in 2012, followed by Kurnell in 2014, and Bulwer in 2015.[12]
- New Australian refineries are uneconomical, due to competition with Asian mega-refineries, and transition risks are also a major consideration for investors.[13]
- Ageing refineries are also less resilient to the effects of climate change. They are likely impacted by increasing average and extreme temperatures, extreme weather, and as coastal infrastructure, rising sea levels and increased storm surges.

[8] Interim Report, p 26.

[9] Interim Report, p 4.

[10] The Australia Institute (2019) *National Poll: Australians Opposed to Drilling in the Great Australian Bight,* http://tai.org.au/content/national-poll-australians-opposed-drilling-great-australian-bight

[11] ReachTEL (2018) *Solomon – Final Results,* http://www.tai.org.au/sites/defualt/files/TAI-28March18-Solomon%20-%20Fracking%20Poll%20ReachTEL.pdf

[12] Sydney Moring Herald (2014) *BP refinery closure leaves Australia more reliant on fuel imports,* https://www.smh.com.au/business/companies/bp-refinery-closure-leaves-australia-more-reliant-on-fuel-imports-20140402-35y4p.html

[13] Ibid.

Reducing oil use

Currently Australia's oil use is increasing. It is argued throughout the Interim Report that transport energy security requires reducing oil use.

This requires both increased fuel efficiency and substitution to non-oil based transport, including active transport, public transport, and electric passenger vehicles. In this respect Australia is a long way behind where it should be.

FUEL STANDARDS

Australia's weak fuel standards leave us among the least fuel-efficient fleets in the OECD. This is clearly not in Australia's economic and security interests.

Even the Business Council of Australia, which counts many oil companies amongst its members, has long called for increased fuel efficiency standards, arguing it would save Australia money and reduce emissions.[14]

Government refusal to take even this modest step is making our transport systems more expensive, less secure and more emissions intensive.

Australia is currently entirely reliant on imported passenger vehicles. This makes it hard to understand why governments will not impose requirements on these imports to bring them at least in line with comparable markets.

Given the timescales involved in vehicle stock turn over, increasing fuel standards for the flow of all imported cars should be an urgent priority.

ELECTRIC VEHICLES

Rapid cost reductions in electric vehicles (EVs) are creating enormous opportunities for increased transport energy security. Replacing imported fuel with domestically produced electricity will have benefits for energy security.

Most obviously, it will increase the domestic supply of transport energy. The decentralisation and diversification possible in renewable energy systems can also create further resilience in energy supply.

[14] See for example: BCA (2016) *Vehicle Emissions Discussion Paper,* https://d3n8a8pro7vhmx.cloudfront.net/bca/pages/4038/attachments/original/1528953385/Submission_to_Vehicle_Emissions_Discussion_Paper_FINAL_April_22.pdf?1528953385

Moreover, CSIRO modelling shows that policy to better integrate EVs into Australia's grid can reduce both emissions and power prices, by making better use of grid infrastructure.[15]

As the Report notes, Australia is lagging far behind the rest of the world when it comes to electric vehicle uptake.[16] This is largely because there is no national policy to promote EVs.

By contrast, policies in Norway, a major exporter of oil, have seen electric vehicles make up the majority of new car sale in the past year.[17] Jurisdictions with end-dates for the last sale of oil-based cars include the UK, France, California, India and China.

Even without policy, Australia will be affected by the shift by most major manufacturers to electric vehicles and away from internal combustion engine vehicles. Failing to plan for this shift is itself an energy security risk.

Policy to shift to EVs is therefore a crucial component of any transport energy security framework.

Beyond increasing uptake of electric vehicles, Australia could further improve its transport energy security by embracing associated manufacturing opportunities.

Despite the much publicised exit of the Australian car manufacturing industry, ABS data show that 30,000 Australians are employed in motor vehicle and motor vehicle part manufacturing, including a number of factories producing EVs, with more planned. Currently there are battery factories announced and planned at various regional cities, and proposals in Western Australia to increase the value of Australia's dominant position in global battery minerals markets.

Enhancing these economic opportunities would further increase Australia's transport energy security.

POLICY WINDOW OPEN

Policy implementation in complex areas often requires a 'window' of opportunity.

The Australia Institute's research shows the window is wide open, with strong public support for measures that would increase transport energy security.

[15] CSIRO and ENA (2017) *Electric Network Transformation Roadmap,* https://www.energynetworks.com.au/electricity-network-transformation-roadmap

[16] Interim Report, p81

[17] Quicke (2019) *Driving Norse: Electric Vehicle Policies in Norway,* http://www.tai.org.au/sites/default/files/P718%20NPC%20Driving%20Norse%20-%20EV%20Policy_0.pdf

Nearly four in five Australians support requiring new cars sold in Australia to be more efficient, even if they cost a bit more up front. There is also strong public support for a range of policies to support electric vehicle uptake, including

- government built charging stations (79% support),
- government procurement of EVs for its own fleet (76%),
- requiring new apartment blocks to include EV charging stations (73%), and
- government loans for EVs (55%).[18]

Notably, respondents were responding to policies without any explanation of energy security benefits. Awareness of such benefits are likely to increase support further.

HYDROGEN AND BIO FUELS

While EVs with batteries have been the focus here, we note that a range of other alternatives exist, including both biofuels and hydrogen. Notwithstanding the rapid commercialisation and scale of EVs, there is a role for appropriate research, development and deployment support to other energy sources.

One issue with these approaches to transport energy security is ensuring their production is not itself linked to liquid fuels. Fossil fuel based hydrogen would be heavily reliant on fossil liquid fuels, especially when produced from coal. Biofuels produced in reliance on the agriculture sector would also be reliant on fossil fuel.

Such approaches are unlikely to support transport energy security.

PUBLIC AND ACTIVE TRANSPORT

The Interim Report appears to pass over the opportunities and need to increase public and active transport (e.g. bicycle and walking).

Australia has high rates of car use, even in our metropolitan cities. Policies to encourage public and active transport would reduce energy insecurity, especially where public transport is electricity based. Policies could include behavioural nudges, financial incentives, changes to planning zones and infrastructure financing. Electrification of public transport (e.g. electric buses) can further decrease emissions and increase security.

[18] The Australia Institute (2019) *Polling – Policies for low emissions and electric cars,* http://www.tai.org.au/sites/default/files/Electric%20Vehicle%20Polling%20-%20Aus%20Institute%20%5BWEB%5D.pdf

While these issues span jurisdictional levels, the Commonwealth can play a strong role in promoting and coordinating progress. These issues should be central to consideration of reducing reliance on imported oil.

Commitment to decarbonise transport

The discussion above illustrates how increasing transport energy security could at the same time address Australia's commitment to decarbonise its transport sector. The lack of policy on transport energy security is also increasing Australia's emissions. Conversely, decarbonising transport may be easier when supported by the strong policy arguments arising from energy security.

The goal of the Paris Agreement, to limit warming to well below two degrees, should be central to all policy discussion of energy security. In the Paris Agreement, Australia noted that current pledges to cut emissions by 2030 are not enough and committed to increase these pledges in the future. Australia also committed to phase out fossil fuel use in the second half of the century.

The transport sector is the third highest polluting sector in the Australian economy, making up 18% of current emissions, having increased by 57% on 1990 levels.[19] Cars currently represent the largest source of emissions within the transport sector. Car emissions have grown by 25% since 1990.[20]

ELECTRIC VEHICLES CHARGER WITH CLEAN ENERGY

A common argument against electric vehicles in Australia is that they substitute oil for a largely coal based energy system, increasing emissions.

This argument is misguided for three reasons.

First, the energy system is already decarbonising and can decarbonise much quicker, as the cost of renewables and storage comes down quickly. Second, many EVs owners are likely to capture benefits from their EV 'behind the meter', linking it up with a solar PV array and household storage.

Third, increased grid demand from EVs would induce new supply, which given the economics of new generation would be renewable. The CSIRO has shown that solar and wind, backed up with six hours of storage, is now the lowest cost form of new generation.

[19] Commonwealth of Australia (2016) *National Greenhouse Gas Inventory,* http://ageis.climatechange.gov.au/NGGI.aspx

[20] Climate Analytics (2019), *Australia's Vehicle Fleet- Dirty and falling further behind,* https://climateanalytics.org/publications/2019/australia-climate-factsheets-vehicle-emissions/

Even while the *average* generation on the grid is largely coal power, the *marginal* generation on the grid -- that is, from new investment -- is likely to be renewable.[21]

Additionally, increased demand from EVs will not only save consumers on reduced petrol consumption with the right policy can also downwards pressure on power prices for everyone. CSIRO and ENA find that flexible use of existing grid assets, planning and coordinating EV demand profiles and responses to market prices will help reduce both power prices and emissions.[22] Changes to market rules to increase competition, such as demand response aggregation and 'the five minute' bidding rule, will favour EVs and enable them to make greater value use of the grid.

Similar points apply to energy peaking or remote electricity requirements. While liquid fuel is currently used in these contexts, it is relatively expensive and increasingly replaced by solar, wind, batteries, pumped hydro and demand response. Increased requirements for grid flexibility and falling costs of meeting those requirements create needs and opportunities for reducing liquid fuel reliance.

NEED FOR A PARIS-CONSISTENT SCENARIO ANALYSIS

Failing to take action on climate change is itself an energy security risk. Climate change will impact on transport energy security directly, but energy transition risks also create threats to energy security, through uncertainty, disruption and risks of stranded assets. 'Transition risks' are only exacerbated by ongoing delay in action.

In a best-practice approach, an energy security framework would integrate Paris-consistent emissions targets.

As a minimum, the Department should *consider* a transport energy system under a Paris-consistent scenario.

'Scenario analysis' is used by energy analysts and increasingly in the corporate world under the recommendations of the G20's *Taskforce on Climate-related Financial Disclosures* (TCFD), to explore risks and opportunities of success under the Paris Agreement. As the International Energy Agency's *Sustainable Development Scenario* shows, mitigating climate change, reducing air pollution and sustaining economic growth are all possible together. However, for this to happen there must be greatly increased policy ambition, including tighter fuel standards and increased EV uptake.

[21] Richardson (2018) *Submission to the Senate Inquiry into electric vehicles* http://www.tai.org.au/content/submission-senate-inquiry-electric-vehicles

[22] CSIRO and ENA (2017) *Electric Network Transformation Roadmap* https://www.energynetworks.com.au/electricity-network-transformation-roadmap

The Department's ongoing work in this area should use and emphasise scenarios relating to alternative uptake scenarios, including scenarios consistent with Australia's commitment under Paris to consider increasing targets consistent with a 2 degree budget.

CONSULTATION WITH NEW TRANSPORT INDUSTRIES

In developing the final Review and relevant scenarios, the Department should ensure it increases the consultation with industries required to drive this transition, including electric vehicle companies, renewables and smart energy companies, and the financial sector. Historically the debate has been dominated by fossil fuel company interests, reflected in the very framing of the issue as "liquid fuel security". It is important that non-oil and non-liquid fuel industry perspectives are considered fully, as they are central to reducing transport energy security risks.

Conclusion

To meet our obligations under the Paris Agreement and address risks to transport energy security, Australia must reduce its reliance on imported fuel and shift towards locally generated power, a more decentralised energy system, and higher uptake of electric vehicles. This requires government policies with specific electric vehicle targets and fuel efficiency standards, and government incentives for low and zero emissions vehicles. By contrast, domestic supplies of oil and failing to change the vehicle fleet will both increase emissions and do little to improve energy security.

In conjunction, the review of the *LFE Act* announced by the Minister is clearly pressing. Focus is needed on the provisions of the *LFE Act* which currently hamper effective Government responses to a fuel emergency.