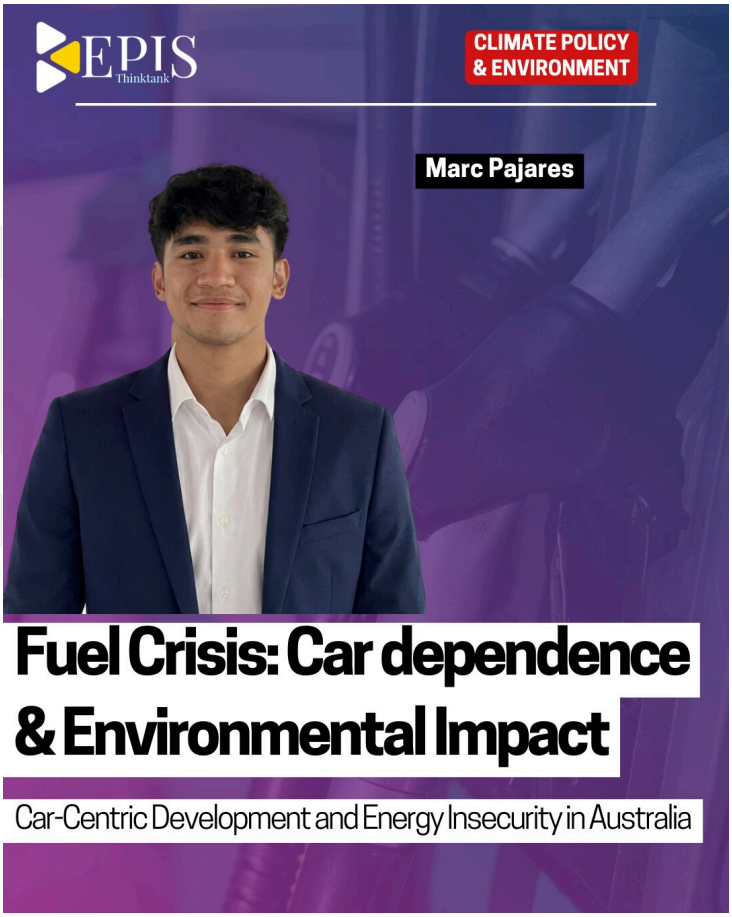
Fuel Crisis: Car dependence & Environmental Impact

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Introduction:

Australia's economy has developed into a leading world economy, projected to reach $2.12 Trillion USD in 2026 (Australian Bureau of Statistics, 2025). Leading in key sectors such as international trade, science, technology, and healthcare (Australian Government Department of Foreign Affairs and Trade, 2022). The country's rapid economic and population growth has also fuelled a strong emphasis on a car-centric urban planning model, leading to urban sprawl and high dependence on light vehicles.

Around 70–76% of Australia's population lives in major cities (Australia State of the Environment, 2021). However, this high level of urban concentration in the case of Australian urban centres does not correlate with high population density. Australian cities have been characterised by urban sprawl and relatively low-density development, which reinforces and perpetuates strong reliance on cars and construction of car-centric infrastructure (Spencer et al., 2015). Favouring light vehicles as the primary mode of transportation has revealed vulnerabilities in the Australian economy and infrastructure, most importantly, the increasing reliance on imports of fuel.

While loose urban development policies allow for urban sprawl and car-centric infrastructure, the Australian mentality and preference for single-unit housing with land exacerbate these issues further, as it is ingrained into the "Australian Dream" (Nerida Conisbee, 2017). This is compounded by continued population growth, with the Australian Bureau of Statistics (2025) reporting a net overseas migration gain of 556,000 people in the 2023–2024 financial year. This raises the question: *How does the Australian government address the housing crisis and climate policy while developing its economy to become more self-sufficient and less reliant on imports for its essential economic activities?*

To address it, this brief will first examine how underdeveloped domestic urban infrastructure, coupled with Australian foreign policy favouring imports of fuel in particular, leaves Australia vulnerable to foreign events. It will then analyse the environmental and climate security risks associated with urban sprawl and car-centric infrastructure.

Underdeveloped Australian domestic infrastructure and policy failure

Australia's international fuel vulnerability can be traced to how its infrastructure is designed. According to the Australian Bureau of Statistics Transport Consensus, 91.3 % of households reported having at least one vehicle, and 55.1 % reported having two or more vehicles (Australian Bureau of Statistics, 2021). This illustrates the scale of how dominant light-vehicle ownership is in Australian society, which also reflects the infrastructure, prioritising car-centric urban design and facilitating urban sprawl through car ownership. Light vehicles such as cars are also reported to be the most popular mode of transport to get to work in every state and territory in Australia, accounting for 52.7 % of the Australian workforce solely driving to work in 2016 (Australian Bureau of Statistics Transport: Census, 2021). This highlights the daily usage of cars in Australian contexts where private vehicles play a central role in daily transport. The Australian Bureau of Statistics' Survey of Motor Vehicle Use in 2020 revealed that Australia's fleet of approximately 19.77 million light vehicles collectively consumed around 33,019 megalitres of fuel, which equates to an average of roughly 1,670 litres of fuel per vehicle for the year. This reflects the nationwide reliance

on cars for commuting, work, education, and essential activities while also exposing a key vulnerability: the heavy reliance on fuel. Given Australia's very limited capacity in producing its own fuel domestically, only having 4 oil refineries currently operating, which are unable to meet domestic demand (Parliament of Australia: Oil refineries and fuel security, 2020).

Climate Security Risks

Beyond the international implications, Australia's car-centric urban planning and infrastructure also pose significant environmental risks. Reliance on light-vehicle transportation systems contributes substantially to global CO_2 emissions. According to the Intergovernmental Panel on Climate Change (2021), transport "accounted for 23% of global energy-related CO2 emissions. 70% of direct transport emissions came from road vehicles" (Intergovernmental Panel on Climate Change, 2021, p. 1674). This is particularly alarming given Australia's heavy reliance on cars for everyday activities, with infrastructure largely designed to prioritise and accommodate private vehicle use. This, in turn, encourages urban sprawl and longer commutes due to the further distances. This reduces the practicality of alternative transport modes, such as walking, cycling, and public transport, which become less efficient and less accessible over greater distances. As a result, reliance on private cars is further reinforced as the most viable mode of transport, further feeding back into car dependence (Miner et al., 2024).

Moreover, to facilitate the tremendous car ownership in Australia, 91.3% (Australian Bureau of Statistics Transport: Census, 2021), Australian urban spaces need to build sufficient automobility infrastructure, including street parking and parking lots. Activities involved in the construction and maintenance of this infrastructure generate large amounts of carbon emissions. A study in Spain estimated roadway life cycle emissions at 8880 to 50,300 t of CO2e per km (Barandica et al., 2013). This underscores that all aspects of car-centric infrastructure, from car usage, road maintenance and parking maintenance, are carbon-intensive processes, exacerbating climate change and the environmental issues. This is particularly relevant in Australia's urban design philosophy as it prioritises private light vehicles over more sustainable alternatives (Miner et al., 2024).

Ultimately, heavy car reliance and urban planning centred around cars create the urban heat island effect, increasing local temperatures and consequently driving higher energy demand for cooling. At the same time, it allocates significant land to parking infrastructure and replaces carbon-sequestering natural spaces with concrete surfaces, which further reduces green space and intensifies environmental pressures.

Policy Recommendations and Global Implications

This brief underscores that Australia's car-dependent urban structure and limited domestic refining capacity have created a heavy reliance on

imported refined fuels, exposing the national economy and security to global supply shocks and geopolitical instability. Addressing this challenge requires greater accountability across urban planning, policy frameworks, and domestic fuel infrastructure, reframing them as components of a broader transnational energy security issue shaped by global oil markets, maritime chokepoints, and multinational supply chains. The relatively fragmented policy approach of the Australian federal government and state governments has allowed these interconnected domestic and international vulnerabilities to persist.

Global events such as disruptions in the Strait of Hormuz, through which roughly one-third of global oil trade passes, highlight how deeply embedded and dependent Australia remains within fragile international fuel networks, despite its geographic isolation (Carter et al., 2022, p. 13). In response, state actors, including the federal, state, and territory governments, should collaborate with sustainability- and climate-focused NGOs to guide investment and policymaking. This includes reshaping urban infrastructure, strengthening domestic refining capacity, and reducing dependence on imported fuels, thereby improving resilience to external shocks.

Australia can draw on existing international policy frameworks developed by intergovernmental organisations such as the United Nations Paris Agreement, the United Nations Sustainable Development Goals, and OECD Environment guidelines as a foundation for policy reform. However, as Australia faces distinct geographic, social, and environmental conditions, these frameworks should be adapted rather than adopted wholesale. Developing a tailored national strategy that reduces car dependence, promotes more sustainable urban design, and aligns with climate objectives will be critical to enhancing both energy security and environmental outcomes.

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