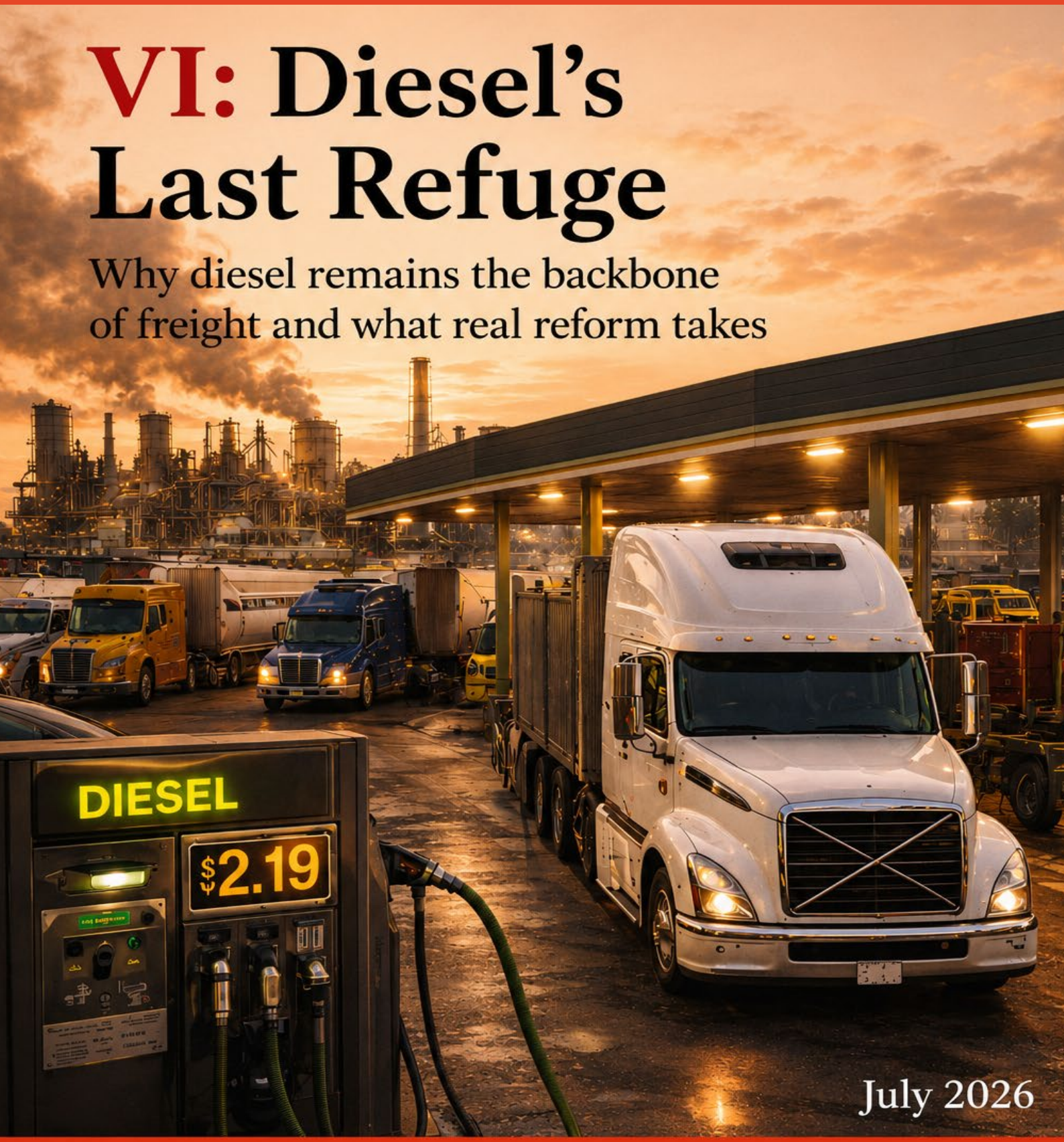
THE UNIVERSITY OF SYDNEY

VI: Diesel's Last Refuge

Why diesel remains the backbone of freight and what real reform takes



July 2026

SUSTAINABLE TRANSPORT SERIES | ISSUE #6

Institute of Transport and Logistics Studies

Acknowledgement of Country

We recognise and pay respect to the Elders and communities – past and present – of the lands that the University of Sydney's campuses stand on. For thousands of years, they have shared and exchanged knowledges across innumerable generations for the benefit of all.

VI: Diesel's Last Refuge

If you want to see the quiet contradiction at the heart of Australia's climate politics, leave the inner city. In metropolitan Australia we celebrate electric buses, light rail extensions, bike lanes and rooftop solar charging the family car. The transition looks sleek and visible. It photographs well. It signals virtue.

Drive a few hours beyond the capital and the story changes. Road trains thunder along highways. Diesel locomotives haul bulk freight. School buses run on aging engines. Agricultural supply chains depend on fossil fuels at every link. In regional Australia, decarbonisation is not sleek. It is stalled.

Transport accounts for roughly 21 percent of Australia's greenhouse gas emissions and produced about 90 million tonnes of carbon dioxide equivalent in 2022, according to the Climate Change Authority (2024). On road vehicles account for around 85 percent of the sector. That means trucks and heavy vehicles are not a marginal issue. They are central to the national climate equation.

Freight alone is immense. The Bureau of Infrastructure and Transport Research Economics estimates the domestic freight task reached about 786 billion tonne kilometres in 2024 to 2025 (BITRE, 2025). That figure reflects the physical reality of a continent sized economy that moves minerals, grain, livestock, manufactured goods and consumer products across vast distances.

Heavy freight emissions are substantial. Industry and academic assessments consistently warn that freight emissions are projected to rise without stronger policy intervention. While metropolitan passenger vehicles dominate

headlines, freight and regional transport form a structural backbone of emissions that receives far less attention.

The uncomfortable truth is this. Australia's sustainable transport conversation is city centric. Policy energy has focused on private passenger vehicles, charging infrastructure, and urban public transport. All important. All necessary. But incomplete.

Regional Australia is being asked to wait.

The market will solve it, we are told. Technology costs will fall. Hydrogen trucks will appear. Electric heavy vehicles will scale naturally.

The market has had years to move decisively and has not. Heavy vehicles are long lived assets. Operators replace fleets cautiously. Capital costs are high. Infrastructure requirements are complex. Without clear policy signals, companies buy what they know will work. Diesel.

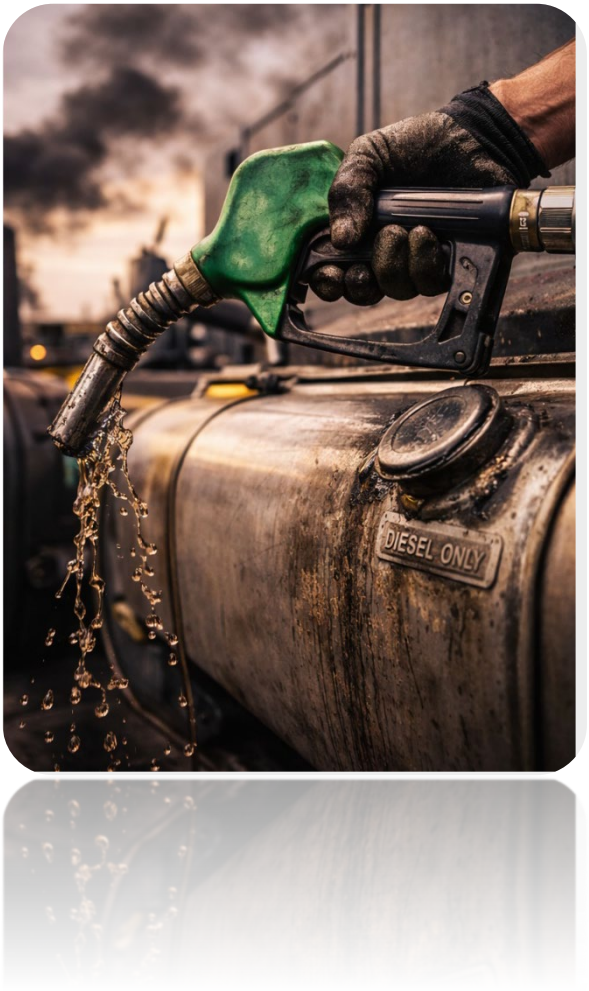
Every new diesel locomotive or heavy truck purchased today risks locking in emissions for fifteen to thirty years. That is not a distant abstraction. It is a planning horizon within reach of 2050.

Consider the freight rail sector. Rail is generally more efficient per tonne kilometre than road, yet much of Australia's freight rail outside electrified urban networks remains diesel powered (Rail Futures Institute, 2024). Industry leaders have warned publicly that without government support for low emissions alternatives, operators will replace aging fleets with new diesel units because reliability matters more than aspiration.

That is rational behaviour in a policy vacuum.

Meanwhile, we continue expanding highways and road freight corridors because road freight is flexible and politically easier to fund. The result is a reinforcing loop. Road infrastructure expands. Road freight grows. Diesel demand persists.

Regional communities are not climate villains. They are climate neglected.



Agriculture depends on diesel machinery and transport. Mining supply chains stretch across remote terrain. Remote Indigenous communities rely on reliable vehicle access. School transport in rural areas often involves long distances that make walking or cycling irrelevant.

A serious national transport decarbonisation strategy would treat regional freight corridors as climate infrastructure, not afterthoughts. It would prioritise electrification of key rail lines where traffic volumes justify it. It would accelerate grid upgrades to support heavy vehicle charging depots along major freight routes. It would use procurement policy to create early demand for low emissions trucks in government and large contract fleets.

Most importantly, it would send an unmistakable signal that the era of automatic diesel replacement is ending.

Critics will argue that regional economies cannot absorb higher costs. That is precisely why policy must shape the transition. Without coordinated investment, smaller operators bear disproportionate risk. With clear direction, supply chains adapt.

There is also an equity dimension that urban policymakers often overlook. If city residents benefit from cleaner air, quieter streets and electrified fleets, regional Australians should not be left carrying the emissions burden that sustains metropolitan consumption. The freight that powers online shopping and supermarket shelves does not materialise at the city boundary. It travels through regional landscapes first.

The politics are difficult because regional transport decarbonisation is expensive and technically complex. It lacks the retail appeal of household electric vehicle rebates. There is no simple lifestyle narrative. It involves infrastructure planning, energy systems, and logistics coordination.

But climate policy that avoids complexity is not serious policy.

Australia prides itself on being a resources and agricultural powerhouse. That status depends on moving bulk goods efficiently. If we fail to decarbonise those movements, our climate credibility weakens. As international markets increasingly scrutinise supply chain emissions, the carbon intensity of transport could become a competitive liability.

We face a choice. Continue electrifying the visible edges of the transport system while the heavy core remains fossil fuelled. Or redesign the backbone itself.

A credible pathway would include electrified freight spines between major ports and inland hubs, targeted support for zero emissions heavy vehicle trials in regional corridors, and pricing reforms that reflect the environmental costs of long-haul diesel trucking.

None of this is glamorous. It will not trend on social media. It requires coordination between energy, transport and industry portfolios.

But if net zero is the destination, regional transport is not a side road. It is the highway.

We can keep celebrating urban sustainability while diesel powers the system that feeds it. Or we can admit that a transition that stops at the city limits is not a transition at all. Regional Australia does not need symbolic climate gestures. It needs infrastructure, investment and policy courage. If we ignore that, diesel will remain the last refuge of a transport system that calls itself modern while running on yesterday's fuel.

References

Bureau of Infrastructure and Transport Research Economics (2025) *Australian Infrastructure and Transport Statistics Yearbook 2025*, https://www.bitre.gov.au/publications/2025/australian-infrastructure-and-transport-statistics-yearbook-2025/freight.

Climate Change Authority (2024) *2024 Sector Pathways Review: Transport, https://www.climatechangeauthority.gov.au/sites/default/files/documents/2024-09/2024SectorPathwaysReviewTransport.pdf*.

Rail Futures Institute (2024) Reducing emissions in Australian domestic freight transport, https://www.railfutures.org.au/wp-content/uploads/2024/07/240718-RFI-Submission-Reducing-emissions-in-freight-final-2.pdf.

Sustainable Transport Series

About the authors of this series

John rejoined the Institute of Transport and Logistics Studies as the Neil Smith Research Chair in Sustainable Transport Futures in October 2022, after an 8-year absence. Over the course of his academic career, John has published over 300 scientific articles in peer-reviewed journals, books, and conference proceedings. He has also been an Associate Editor of Transportation, and Co-Editor and Chief of the Journal of Choice Modelling and Transportation Research Part A. He has also held various roles on multiple conference committees both in Australia and overseas.

Since graduating with a PhD, John has been obtained numerous grants worth over $3.4 million. These include a number of ARC discovery grants in the areas of Public Health, Transportation crowding, general economic theory related to utility separability as well as one on improving the external validity of Discrete Choice Experiments. In addition to academic grants, John has been involved in $9 million in industry-based contract research since the year 2005. Find out more about John: https://profiles.sydney.edu.au/john.rose

Andrea joined the Institute of Transport and Logistics Studies as the Neil Smith Lecturer in Sustainable Mobility and Accessibility in March 2023. Before becoming a lecturer, Andrea spent three years as visiting research scholar thanks to two scholarships, the Early.Postdoc mobility and the Postdoc mobility, awarded by the Swiss National Science Foundation. Andrea holds a Master of Science in Statistics with Honors from the University of Bologna and a PhD in Economics from the University of Lugano. Over the years, Andrea has taken part in different consulting projects with several public and private institutions such as NSW Government, University of Florence, and University of Catania. Find out more about Andrea: https://profiles.sydney.edu.au/andrea.pellegrini

For more information
University of Sydney Business School
Institute of Transport and Logistics Studies
business.itlse@sydney.edu.au
sydney.edu.au

CRICOS 00026A TEQSA PRV12057