

Category	Hurdle
Vehicle Design Regulations	Limited weight allowances
	Limited width dimensions
	Fragmented Heavy Vehicle Regulations
National Targets	No Emissions Standards / Sales Mandates
	Uncertain National Strategy and Targets
Grid Readiness	Capacity planning and connection processes Demand management
Electricity Pricing	Network tariffs
	Retail energy costs
Infrastructure	End of life for BEV and FCEV components
	Public Charging Infrastructure for Heavy Vehicles
	Technical Interoperability / Charging & Fuelling Standards

Technology Maturity	<p>Undeveloped Hydrogen Refuelling Network</p> <p>Hydrogen Charging</p>
Commercial Factors	High Upfront Vehicle Costs
	Uncertain Residual Values and Financing
	Limited Financial Incentives
	Limited Model Availability and Supply
	Small Operator Risk
	Regulatory Uncertainty on Road User Charges
	Insufficient Workforce & Support Infrastructure
	<p>Renewable Fuel Availability and Policy</p> <p>Weak Demand Signals and Government Procurement Frameworks</p>
	<p>Underdeveloped Modal Alternatives</p> <p>Technological Uncertainty for Long-Haul</p>

Operational Adjustments Required

Cross-Agency Coordination Mechanisms

Implementation and Accountability
Frameworks

Knowledge Gaps and Decision Support

Commercialization and Manufacturing
Capability

Battery Supply Chain Vulnerabilities

Principle / Agent Problems for Fleets

Hurdle - Description

Current heavy-vehicle mass limits prevent battery-electric and hydrogen trucks from carrying equivalent payloads due to their heavier components, reducing economic viability.

Australia's unique truck design rules (limiting trailer width to ~2.5m) restrict available zero-emission models, as trucks must be ~2% narrower than in other markets. Rules on axle spacing and tyre configuration further limit allowable loads, impeding importation of newer models and the use of efficiency measures like wide single tyres. There are safety concerns about changes.

Regulations for mass, dimensions, and road access vary across states, creating a complex patchwork of exemptions. Some states (like NSW) have interim zero-emission vehicle mass exemptions, but these aren't uniform nationwide, adding compliance overhead and uncertainty.

Australia lacks binding greenhouse gas standards or zero-emission sales targets for heavy vehicles, reducing manufacturer incentives to supply zero-emission models to the Australian market. Grattan Institute recommends introducing ZEV truck sales targets (starting at 2% in 2024, rising to ~100% by 2040).

The absence of a unified national roadmap with specific interim freight decarbonisation targets creates policy uncertainty, causing industry to delay action despite long investment lead times for trucks and infrastructure.

Many depots and truck stops face delays and high costs to upgrade grid connections for high-power charging. Local network capacity is often insufficient for large charging loads, requiring substantial infrastructure upgrades.

Tech for smart charging

Demand-based electricity tariffs (peak demand charges) can make fast-charging extremely costly, disincentivising installation of depot and en-route chargers. While wholesale electricity costs can be managed (down to ~5c/kWh) with PPAs and hedging, network demand tariffs remain problematic.

I need certainty on my elec price to run business or site well. Generally achieved if scaled, but there is a shortfall in the early years due to utilisation.

Regulatory frameworks for heavy-duty battery and fuel cell recycling, reuse, and disposal are underdeveloped. Extended producer responsibility schemes, recycling standards, and end-of-life management pathways are not yet established, creating uncertainty about lifecycle environmental impacts and costs.

Very few publicly-accessible charging stations suitable for heavy trucks exist on freight corridors, limiting zero-emission vehicle use to shorter routes or requiring impractical detours. This is especially problematic given Australia's geography and trucking routes, as well as the hotter climates that can degrade battery efficiency.

Ultra-high-power charging standards (e.g., megawatt chargers) are not yet deployed, raising interoperability concerns. Similarly, standards for hydrogen refuelling pressure and nozzles need harmonisation, potentially delaying infrastructure rollout.

Hydrogen refuelling stations are virtually non-existent in Australia beyond a few pilot sites. Until a refuelling network is built out, fleet operators cannot practically deploy hydrogen trucks for long-range routes.

Electrolysers and green hydrogen systems not at commercial viability tipping point
Need to think about MW / fast charging development

Zero-emission heavy trucks cost significantly more than diesel equivalents (up to AUD\$200,000 more for articulated trucks). This price premium, combined with uncertainty around battery life and resale value, makes fleet operators hesitant to invest.

Financiers are uncertain about zero-emission truck values over time due to questions about battery longevity, future technology changes, and second-hand demand. This leads to higher financing costs and concerns about resale value that discourage uptake.

Australia lacks targeted incentives to offset the higher capital cost of zero-emission trucks, with no federal purchase subsidy or nationwide tax credit for heavy EVs. Climateworks recommends measures like tax breaks, grants, or credits to make zero-emission trucks competitive.

The Australian market has very limited selection and supply of zero-emission truck models, with few right-hand-drive options. Manufacturers prioritise other markets (EU, US, China) due to Australia's small market size and lack of strong emission standards.

Australia's freight industry is highly fragmented with many small businesses and owner-drivers who lack capital for zero-emission trucks and may struggle with operational uncertainties like charging downtime. Without targeted support, the transition may be limited to large fleets.

The current road-funding system doesn't fully accommodate zero-emission vehicles. While electric trucks currently don't pay equivalent road taxes, uncertainty exists about the possibility that future governments may impose distance-based charges, making long-term cost planning difficult.

There's a shortage of technicians trained to service high-voltage truck drivetrains or hydrogen systems. Towing and repair services for heavy EVs or FCEVs are not widely established, potentially causing longer downtime for early adopters. Mechanics, spare parts, and emergency repair services for electric or hydrogen trucks are not widely available, especially in remote areas, raising concerns about potential downtime.

Australia lacks clear policy on biofuels for heavy transport with no national renewable diesel mandate or strong incentives. Administrative barriers exist for using higher biodiesel blends (>5%), and limited domestic production means renewable fuels remain a minor part of zero-emission strategy.

Government and large corporate procurement doesn't prioritise zero-emission logistics. Without green procurement requirements, demand signals for zero-emission trucks remain weak.

Lack of viable rail or intermodal options means road freight carries a larger decarbonisation burden, which is especially challenging for long-haul routes.

It remains unclear whether batteries, hydrogen, or other technologies will dominate long-haul trucking, making investment risky for operators.

Battery trucks have shorter range and require charging breaks, impacting logistics. Schedules and routes must be adjusted for charging or refuelling, requiring more planning and potentially additional vehicles.

Effective policy implementation requires coordination across transport, energy, environment, industry, skills and regional development agencies that is currently lacking. Without formal coordination mechanisms spanning federal and state governments, policy efforts remain fragmented and may work at cross-purposes.

Current approaches lack clear responsibility assignment, monitoring systems, and adjustment mechanisms. Without dedicated implementation bodies, progress tracking, and regular policy review processes, well-intentioned policies risk failing to deliver practical outcomes.

Fleet operators and infrastructure planners lack practical information and decision tools to guide transition planning. The absence of credible, accessible guidance on technology selection, infrastructure requirements, operational adjustments, and business case development creates planning paralysis and reinforces status quo operations.

Australia has limited domestic manufacturing and assembly capability for zero-emission heavy vehicles or components. Without strategic industry development policy, Australia risks missing economic opportunities in the transition while remaining dependent on imported vehicles and technologies that may not be optimized for local conditions.

Limited Australian battery manufacturing capacity and reliance on imported components create supply risks. Without supply chain policy, zero-emission truck availability may be constrained.

When vehicle owners differ from operators, or when contracts don't reward emissions reductions, zero-emission vehicle adoption is disincentivised. Contract structures often don't account for different operational profiles of zero-emission vehicles.

Category	Solved?	Impact (1-5)
Regulatory	Partially	5
Regulatory	Partially	5
Regulatory	No	4
Policy	No	5
Policy	No	4
Infrastructure	No	4
Infrastructure		2
Market		4
Market		4
Policy		3
Infrastructure		5
Technology		2

Infrastructure	5
Technology	5
Technology	2

Market	5
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Market	4
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Policy	5
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Market	3
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Market	2
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Policy	4
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Market	3
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Policy	3
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Policy	3
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Infrastructure	1
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Technology	4
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Operations2

0

0

0

0

Policy0

Market2

Solutions?

Grattan Institute / ClimateWorks recommend updating the Heavy Vehicle National Law to allow trucks to carry up to 7 tonnes on their steer axle from 2023, as long as the truck is fitted with tyres that are at least 375mm wide.

The recently announced Safer Freight Vehicles package increases the overall width for Prime Movers from 2.5 to 2.55 metres, enhancing the safety and freight productivity of new trucks. Trailers are stuck at 2.5m - should move to 2.6m.

Needs a coordinated national approach through the Heavy Vehicle National Law - with all signatory states adopting changes.

I think safety and driver breaks would also fit in here.

Grattan recommends: Introduce binding zero-emissions sales targets for new trucks (starting at 2% in 2024, rising to 100% by 2040 for rigid trucks and 70% for articulated trucks); introduce a fuel efficiency standard. **Note Euro VI.**

BZE recommends that by 2030 all new commercial vehicle sales are zero emissions and we have retrofit 20,000 ICE trucks to electric. By 2040, all buses and trucks on Australian roads are zero-emission models

Visibility of capacity data and coordinated planning on this is key. Logic check - are the grid capacity investments and local subsidies the same issue or separate?

Targeted investment in charging infrastructure. BZE mentions Janus Electric's battery swap-out stations. Collaborate with industry through the Driving the Nation Fund.

[BH: this was a problem in consumer early days, but there's been great progress on plug harmonisation and OCCP adoption for chargers. Not sure where we are up to with this in HV specific chargers]

Upfront purchase rebates, stamp duty exemptions, or accelerated depreciation

Targeted support (such as tailored financing, aggregated purchasing or rental models) to achieve a just and equitable transition

Climateworks highlights the need for training and skills programs to grow ancillary industries around zero-emission trucks – a gap that represents a softer barrier to uptake.

Without government direction (such as a blending standard or sustainability framework), renewable fuels remain a minor part of the zero-emission heavy fleet strategy.

Merge with end of life or keep sep?

Key Blocker

Road infrastructure concerns about impact of heavier vehicles on existing roads, bridges and tunnels. Exploding maintenance budgets, with no way to recover.

Responsible?

Federal Govt (Heavy Vehicle National Law) - WA / NT sit outside this framework

- Protecting presence of local manufacturers
- Safety considerations on wider trailers

Federal Government
(Australian Design Standards)

- Federal-State Coordination

Infrastructure and Transport
Ministers' Meeting (ITMM)

- Lack of political commitment to firm targets
- Transport is hard and will require steep changes

Federal Government

- Lack of political commitment to firm targets

Federal Government

Limited planning for high-power demands of commercial EV fleets

Probably a mix of
Govt/Industry:
- Energy market operators
- Distribution network service
providers
- AER / AEMO

New

Coordinated planning, significant \$ investment required

Federal and state governments,
industry