



What's the alternative?

A guide to reducing emissions for heavy and mixed fleets

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In the race to net-zero, transport is one of the hardest to abate sectors.

Demand for electric and hybrid vehicles has increased rapidly, but for heavy vehicles, swapping a 600-horsepower diesel tractor unit for an EV isn't all that easy yet.

While there are some options in the market today such as hydrogen or LNG fueled vehicles the technology for alternatively powered heavy vehicles is still under development – both the trucks themselves and the infrastructure to support them.

In the meantime, smart operators need to find ways to reduce emissions in order to meet government targets and stay in business. Every fleet operator in Australia should already be thinking about how they plan to transition to zero emission vehicles and when.

Whether you choose EV, hybrid, hydrogen or a more efficient ICE vehicle, will depend largely on the needs of each individual fleet.

The common theme across the transport sector though, is that by measuring and improving fleet efficiency – across new and existing vehicles – you can make a significant difference to carbon emissions.

With all governments in Australia having committed to net-zero by 2050¹, there is an immediate need to address emissions in the transport sector. The average lifetime of Australia's trucking fleet means we have a limited number of years to accelerate uptake to reach our climate targets. (Electric Truck Report P2).

Over 40% of all businesses are planning on replacing some vehicles with low/zero-emission vehicles in the next 2 years

EROAD's The Road to Sustainability 2023



The pressure is on

Emissions and NET-ZERO

19% Transport emissions in Australia make up 19 per cent of our total emissions



38% The road freight sector contributes 38 per cent of our total transport emissions.

4%

8%

23%

Heavy vehicles make up around only 4 per cent of the road vehicle fleet yet they perform about 8 per cent of road vehicle kilometres travelled (VKT). In total, heavy vehicles account for 23 per cent of all road transport fuel consumed in Australia.

The Transport sector makes up 19% of Australia's emissions² and will come under increasing pressure to decarbonise over the next 10 years

- The average age of trucks in Australia is over 15 years
- All Australian governments have now committed to net-zero by 2050. This target cannot be achieved without decarbonising road freight and the broader transport sector
- In order to reach our climate targets, the last internal combustion engine trucks must be sold by 2040
- A recent sustainability survey from EROAD found 57% of fleet operators do not currently have a plan to meet Government's 2030 Carbon Emissions Reduction goals¹⁸

98% Small and family businesses make up almost 98 per cent of all trucking operators,



70%

and 70 per cent have only one truck.

Not well known, less than 0.5 per cent of all operators have more than 100 trucks in their fleet.

0.5%

1 

100



Diesel is one of the most significant costs for a trucking business - with fuel representing around 20 per cent of short-haul operators' costs and around 35 per cent of long-haul operators' costs. Trucking operators, especially smaller operators, have significant difficulty passing increases in the volatile price of diesel on to clients.

Options for heavy vehicles

Operators need to look at fleet optimisation and changing driving behaviour as well as vehicle replacement to reduce emissions

Australia's heavy vehicle fleet is ageing. According to a recent Austroads report the heavy vehicle fleet is now more than 15 years old⁴, which has a huge influence on heavy vehicle emissions and fuel consumption. The market for zero emission light vehicles continues to grow steadily. But for heavy-duty vehicles, technology availability, pace of infrastructure change and regulatory barriers have slowed progress, despite an increase of nearly 38% in zero-emission medium- and heavy-duty vehicle models around the world from 2021 to 2023¹⁹.

Besides vehicle replacement, transport operators and fleet managers could reduce their emissions and save costs on fuel by focusing on fleet efficiency and optimisation, including driver behaviour, route optimisation, fleet data analysis, and performing a stock take on their current fleet.

When it comes to reducing emissions, there is no room for a one size fits all mentality within the transport sector.

So, what can you do now to reduce your emissions and fuel?

- Track fleet performance with telematics
- Optimise your fleet
- Coach drivers to change behaviour and reward eco-driving
- Vehicle replacement – EV, hybrid, hydrogen or a newer, more efficient ICE vehicle



Track fleet performance with telematics

Telematics data can play a huge role in how transport operators manage their fleets

Telematics can give you deeper insight into the performance of your fleet, and help your drivers operate their trucks more safely and efficiently.

Paul Illmer is the Vice President, Emerging Technology and Business Development at Volvo Group Australia. He says, “We’re developing a clear picture of the top five steps customers need to take regarding what applications make sense for electric trucks. Telematics data is vital in helping us understand where the trucks operate, the nature of their loads and where they stop and start.”

“The information we’re able to extract is just awesome. For example, we’re able to look at the weights of consignments and how many kilometres the truck has travelled and calculate the income per linehaul and the average income per kilometre. It gives us the knowledge to look at a route and decide whether it’s viable, if it needs to be changed”

Paul Farnan, National Operations Manager at Refrigafreighters





Turn your data collection into useful insights that can impact your bottom line

There is so much data available to be extracted from so many different types of systems, sometimes it's almost information overload. So how we can take this information and translate it into meaningful outcomes?

Sam Marks is the Senior Adviser for Infrastructure and Sustainability at the Australian Trucking Association (ATA). He says, "Telematics is critical. Most well-established operators tend to already need telematics in terms of understanding where their trucks are going and how they're running. It will become more important with the shift to zero emission trucks because governments will need to look at how they change the road user charging model here in Australia as well."

To really make changes to your bottom line, it's not just about looking at the overall picture anymore. You need to dive deeper, and that requires a lot of data and analysis.

"It takes accurate information to successfully run our business, EROAD gives us that information. It's our little secret weapon."

Zoe Moulton, Owner of
Pingelly Transport

Make evidence-based decisions about fleet reduction or conversion

In any industry, and in any business, making changes can be a huge process, and making those changes stick takes a concerted effort and the buy-in of all stakeholders.

Telematics data is crucial to getting the necessary insights so you can make the best decision on what your fleet is doing.

It gives you the ability to be proactive rather than reactive, and it is a game changer for businesses looking to make improvements.

Telematics data can provide the fact-based evidence businesses need to validate fleet reduction and conversion decisions, as well as informing future strategies.

“From how long our brakes have lasted to fuel burn per kilometre, to how many kilometres each configuration of truck and trailer has actually been able to achieve, you can benchmark what you should expect – month in, month out.”

Ken Reilly, Group Asset Manager
at Porter Group

8 in 10 businesses plan to replace older vehicles in the next 2 years.

Only 23% of businesses have conducted a fleet utilisation study which helps identify suitable candidates for replacement¹⁸.

EROAD's The Road to
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Fleet insights from telematics can help streamline operations far beyond the initial scope of reducing or electrifying your fleet

A telematics system can provide all sorts of useful information about driver behaviour, fuel usage, idling, and vehicle health to help streamline operations, and provide a wide range of ongoing benefits far beyond the initial scope of reducing and electrifying a fleet.

With an estimated 100 million telematics units in operation worldwide, businesses of all sizes are embracing the technology to help monitor, streamline and improve their fleet management systems and processes.

Many transport operators have a mixed fleet - heavy trucks as well as vans and cars. Telematics can help you analyse your fleet, reduce the number of vehicles that aren't in use, and move some to electric.

A common concern for those considering the switch to electric vehicles is 'range anxiety' - how far a vehicle can travel before it runs out of power - and having no way to recharge. This worry can be easily solved by using available telematics data on vehicles to identify and optimise the most efficient route.

Using telematics data you can:

- Understand the fuel consumption per vehicle
- Identify the most efficient routes
- Eliminate time wasted tracking down vehicles
- Save fuel costs by monitoring speed and driving behaviour
- Understand how far your vehicles actually travel per day and their longest trips

“We now have the ability to be more strategic and customer focused with the capacity to focus on things like driver coaching, sustainability, improved health and safety, and improved utilisation.”

Josh Hedley, National Fleet Manager
at Downer New Zealand

Optimise your fleet

Effective vehicle utilisation is vital to sustainability efforts

A vehicle's purchase price is only a small percentage of the total cost of ownership. There are also fuel costs, ongoing maintenance and the residual value of a vehicle at the end of its life. These are all factors people are now having to consider.

If fuel is the biggest cost to your business, then reducing fuel usage is the biggest opportunity to make savings, if you can reduce your average per kilometre cost by either introducing a more fuel-efficient vehicle or training and incentivising your drivers to drive more efficiently, then you're getting direct benefits to your bottom line.

Optimise your vehicle for the job.

For long haul journeys, Higher Productivity Vehicles or HPV's are truck- and- trailer combinations which provide the ability to shift more freight efficiently, with the spin- off of greater environmental and safety performance.

HPV's are likely to comprise a quite small but highly productive proportion of the freight vehicle fleet. They will never be used on residential streets but will typically be employed on arterial roads, freeways, and designated B-double routes. Even access to local roads needs to be subject to local government approval.

"A high productivity vehicle can move the same freight task in less truck trips. For example, a 1,000-tonne freight task can be done in 42 trips or 20 trips, saving you an incredible amount of fuel and emissions if you have an HPV."

Sam Marks, ATA

Reducing fleet size means working much smarter with the resources you do have

“Operational efficiency is important. Good businesses already pay attention to that because it affects their bottom line.”

Sam Marks, ATA

Reducing fleet size is one way businesses can help reduce their emissions. It's imperative that transport operators also reduce their carbon footprint by optimising fleet efficiency. It's not going to be efficient or cost effective to replace vehicles that are under-utilised or could be changed to shared vehicles for example.

In order to gain a good understanding of your business requirements, it is important to look at your actual needs and make sure you are properly resourced.

Not all trips are the same, and careful selection of vehicles is essential to an efficient fleet. Depending on the load and the route, that selection will vary massively, and low emission options face the same problem. When it comes to reducing emissions, the industry must have a balance of EV and hydrogen solutions and vehicle types fit for purpose.

Sam Marks from ATA says “Australia will need both battery electric and hydrogen fuel cell trucks. Hydrogen has strong potential for longer distance and heavier haulage transport tasks. State Governments have already announced plans for hydrogen highways up the east coast of Australia. With the right policy support from government, I think we could see Hydrogen trucks in use, by 2030 at the latest.”

“Driver training, reducing empty running, retiring the older trucks and buying new, such as the Euro six diesel truck, all help to reduce emissions.”

Sam Marks ATA

Fleet Utilisation Self-Assessment

To decide which vehicles to remove and where vehicle use can be reduced, management should ask the following questions:



- ☒ Which cars and/or trucks can we remove from our fleet without significantly impacting operations?
- ☒ Can we use biofuels to help reduce emissions in our heavy fleet while we wait for technology and infrastructure to catch up?
- ☒ What vehicles does MyEROAD recommend that we replace, based on current usage and suitability of alternatives?

Vehicle replacement

There are many different factors fleet managers have to consider to reduce their emissions. Decarbonisation is a complex process requiring long-term commitment and switching your vehicles is just one piece of the big picture.

Alternatively powered vehicle options may currently have limited availability, but some of the latest ICE vehicles offer a low emission alternative now

Newer models are cleaner and more efficient than the older trucks on our roads. If you replaced a 15-year-old truck – the average age of a heavy vehicle fleet – with a Euro 5 or 6 standard vehicle, you'd see a huge reduction in fuel consumption and vehicle emissions.

Globally, emissions standards for diesel vehicles have dramatically improved since the 1990s and early 2000's⁵. Australia imports heavy trucks from Europe, the USA and Japan⁶ where all newer models have been subject to rules that control how much carbon monoxide, hydrocarbon, nitrogen oxide, and particulate matter vehicles can emit per kilometre driven⁵.

Truck makers are developing new technology to meet the new standards, with dramatic decreases in emissions along with improved fuel efficiency. NOx emissions from a diesel Euro 6 standard vehicle have reduced by 67% compared to Euro 5⁷. Their diesel fuel consumption has also decreased, by an average of 8%⁸.

Advantages of new models

- Increased engine efficiency
- Better fuel economy
- More powerful than older models
- Reduced GHG emissions

“Some of the fuel burn is really impressive [...] These Euro 6 trucks are returning up to 2.5 to 2.8 kilometres per litre”

Damon Bryant, Transport Manager
at Alexander Group NZ

New vehicles have vastly improved emissions standards and are more cost-efficient on fuel. But like any technology, it isn't as simple as replacing the fleet to get better cost savings – you need to utilise the technology to its best potential. This means looking at fleet utilisation, route optimisation, and ensuring the vehicle is driven to optimise the technology.

Electric vehicles are a good option for light vehicle replacement

EVs can reduce carbon dioxide emissions by 80%²⁰. With improvements in both range capability and charging infrastructure, electric vehicles make for smarter fleets.

The market has had at least 10 years to mature so there's now a reasonable volume of light vehicles to choose from, both new and used, and as the technology continues to mature, prices will drop.

8 in 10 businesses with large fleets confirm potential customers often consider their sustainability performance when weighing up their services¹⁸



EV limitations

In Australia, it's now well accepted that electric is mainly for your smaller, metro-type configurations. However, the issue is that heavy EVs simply aren't available in any great volume, as OEM trucks are still in their infancy. Most are in the early production phase and supply is extremely limited, confined mainly to the sub-10-tonne urban delivery truck. Even if an organisation is keen to transition their heavy fleet, they can't yet do so at scale. However, there are gains to be had by focusing effort on achieving operational efficiencies and route optimisation to reduce carbon output.

Why switch to an EV?

- Cheap to run - fuelling up on electricity is cheaper than petrol or diesel¹³
- Charge on the go - there is a growing network of fast charging stations
- Great for your brand - it shows you care about the environment
- Good for your customers
- There is no engine noise
- No vibration in cab = Less taxing on drivers^{14,15}
- Fast track your emissions targets
- Running on renewable electricity drives down your emissions profile

Hydrogen fuel cell technology looks promising for future heavy vehicle replacement

Hydrogen is the technology that many in the heavy transport sector have been waiting for. However, compared with the electric and plug-in hybrid market there are still relatively few hydrogen options available. In 2022, there were 20 medium- and heavy-duty fuel cell truck models available around the world, and only a handful of additions planned in 2023.

It answers many questions about alternative fuels, particularly for operators who want to go further, who want to carry more than electric allows for, or who want bigger vehicles whose range isn't long enough.

Hydrogen is the equivalent to the horsepower of a bigger vehicle. It's a real alternative for people to consider for long haul.

That's where it separates itself from the battery-electric. These types of vehicles can travel between regions; they can go where electric vehicles can't, they open the door for long haul freight.

"We feel Hydrogen will play a big part of the energy mix from a transport perspective. Paul Illmer, Vice President Emerging Technology, Volvo.

He adds, "I think we've got a responsibility to derisk the journey for the customer by making sure all the components talk together creating one connected ecosystem, so there's an easy transition for new technology into their existing business. We monitor the trucks once they are in service and can receive alerts to diagnose potential issues early. We do this with electric and will also do it with hydrogen technology".

However, there are limitations. When operating an alternative fuel, you know there aren't thousands of fuel stations along the route like there are for diesel. You can't just pop into the next one or wait until the morning to fuel up.

Ultimately, whether a vehicle is electric, hybrid, petrol, or diesel, each business needs to make the best choice for their carbon footprint and bottom line, by looking beyond the purchase price. This means calculating the total cost of ownership and comparing the cost of buying, running, and on-selling.

"Hydrogen has strong potential for longer distance and heavier haulage tasks."

Sam Marks, ATA

Coach drivers to change behaviour

In the transport sector, a driver can be the difference between making or losing money

The ability to monitor and change driver behaviour is critical to reducing emissions and fuel costs.

Paul Illmer says, “The impacts from driver training and driving behaviour on fuel efficiency can save up to 30% of fuel costs.”

On average, fuel represents about 30% of a trucking operator’s overall costs¹⁶. Any opportunity to reduce this cost not only benefits the operator’s bottom line, but also – by reducing fuel consumption – reduces vehicle emissions.

There are a variety of factors that influence fuel efficiency including the terrain, the load, the engine type, the size of the vehicle, and the region. But one of the most important is how the driver operates the vehicle.

A fuel-efficient driver is a safer driver because they’re not accelerating or braking harshly; the reduction in driveline wear and tear of the vehicle adds to the benefits of such training.

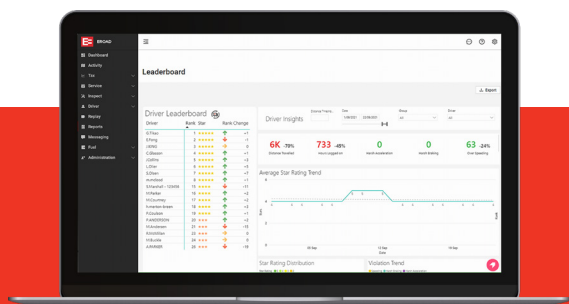
High speeds consume more fuel. Increasing speed from 90km/h to 105km/h can raise fuel consumption by as much as 15%¹⁶. Consumption increases rapidly after 105km/h, and that adds up at the end of a trip, or a day.

Telematics can monitor driver behaviour and detect unsafe driving practices, including excessive speed, harsh braking, and idle times - helping you make sound business decisions based on how your drivers are driving.

“What’s important is making sure a driving trainer has conducted/taught both theoretical and practical coaching, then getting the operator to use Telematics to track the performance.” Paul Illmer, Volvo.

“Not everyone is taught how to drive correctly, how to manage their day and so on. It might just be a simple gear change in the wrong rev range and the driver is getting into the red zone instead of sitting in the economical zone.”

Andrew Forbes, Director at Challenge Logistics Ltd



Identify and reward safe, efficient driving

New vehicles with new technology require new skills – it is essential to train your drivers for optimal vehicle performance

It is critical drivers undertake driver training when a fleet is upgraded.

Investing in driver training will see opportunities for further reductions in fuel consumption, thereby reducing vehicle emissions even further.

In Australia there are a lot of drivers who have been driving for 40-odd years, and driving a truck is second nature to them. But still, the new technology will challenge them.

Encouraging drivers is an essential step in transitioning to the new technology.

Paul Illmer gives an example of a competition run annually by Volvo to test driving efficiency.

“In the Volvo Trucks Driver’s Fuel Challenge, we asked our customers to nominate their best driver to compete in controlled conditions in the same vehicle over a prescribed route. There was a 20% difference amongst the best in fuel savings.”

Looking to reduce your emissions, improve driver behaviour and optimise your fleet?

Talk to EROAD to discover how telematics can guide smart operational decisions today and further down the track.



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1800 437 623
info@eroad.com.au
www.eroad.co.au

