



## Climate Council of Australia

Submission to: **Fuel Efficiency Standard: Cleaner, cheaper to run cars for Australia** - Consultation Paper

Addressed to: Department of Infrastructure, Transport, Regional Development, Communications and the Arts  
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## About the Climate Council

Climate Council is Australia's own independent, evidence-based organisation on climate science, impacts and solutions.

We connect decision-makers, the public and the media to catalyse action at scale, elevate climate stories in the news and shape the conversation on climate consequences and action, at home and abroad.

We advocate for climate policies and solutions that can rapidly drive down emissions, based on the most up-to-date climate science and information.

We do this in partnership with our incredible community: thousands of generous, passionate supporters and donors, who have backed us every step of the way since they crowd-funded our beginning as a non-profit organisation in 2013.

To find out more about the Climate Council's work, visit [www.climatecouncil.org.au](http://www.climatecouncil.org.au).

# 1. Introduction and context

The Climate Council welcomes the opportunity to contribute to the Australian Government's consultation on the design of a fuel efficiency standard for Australia's light vehicle fleet. This is an important - and long overdue - initiative to improve the efficiency of Australia's cars, utes and vans to cut costs for drivers and reduce harmful carbon pollution from the fleet. We urge the Government to move swiftly in designing and delivering this reform, so that Australians can share in the benefits already being enjoyed by millions of drivers around the world.

## Tackling transport emissions is essential to reach net zero

Transport accounts for 19 percent of Australia's greenhouse gas emissions, and is the third largest source of emissions behind electricity and stationary energy (DCCEEW, 2022a). Road transport is responsible for the bulk of transport emissions, with cars and light commercial vehicles alone making up 62 percent of this pollution (DCCEEW, 2022b). Importantly, at a time when emissions from other sectors have started a welcome and necessary decline, personal transport is one of Australia's fastest growing sources of emissions (DCCEEW, 2022b).

Technology solutions available today mean electrifying Australia's light vehicles and powering them with renewable energy is one of the first - and most achievable - steps towards decarbonising transport in Australia. Electrifying Australia's passenger fleets at the same time as we transition the grid to renewable energy will also accelerate overall decarbonisation so Australia can meet - and then go further than - our target to reduce national emissions by 43% below 2005 levels by 2030. The International Energy Agency has also highlighted that it will be necessary to see 100 percent of new vehicles sold be zero emissions by 2035 at the latest if the world is to achieve net zero emissions by 2050 - as the Australian Government and governments globally have committed to do (International Energy Agency, 2022).

Importantly however, decarbonising personal transport is a significantly bigger task than getting all drivers to swap their petrol and diesel vehicles for an electric vehicle (EV). We need to shift the focus of transportation away from being dominated by private cars altogether.

Boosting zero emissions public transport, and building well-connected and safe footpaths and bike lanes gives people much better options so they can choose how to get around and do their bit in reducing emissions. Doing so

will deliver a wide range of further benefits to people living in cities and regions such as cleaner air, healthier communities, lower travel costs, and much more liveable streets and public spaces. The Climate Council encourages the Australian Government to work with States and Territories to develop a holistic approach to cutting emissions from personal transport, in parallel with the design of a fuel efficiency standard as discussed in this consultation paper.

### **A strong fuel efficiency standard will benefit all Australians - no matter what type of new car they buy**

The following section briefly outlines the key benefits that the introduction of a strong fuel efficiency standard can deliver for Australians. While the conversation about this reform often centres around improving the supply of a diverse range of electric vehicles, it will also deliver a range of other significant and important benefits. These include slashing the annual fuel bill for Australian drivers, cutting the national air pollution death toll to save the health system billions, improving national security, and providing Australians with a wider choice of modern, safe vehicles.

#### *Improved air quality*

A strong fuel efficiency standard will help improve the quality of the air in our cities and towns by slashing transport emissions, saving thousands of lives. The latest research from the University of Melbourne has found that air pollution from cars, trucks and fossil-fuel powered buses kills 11,105 Australians every year and results in 12,210 cardiovascular hospitalisations, 6,840 respiratory hospitalisations and 66,000 asthma cases annually (Melbourne Climate Futures, 2023).

By establishing a strong standard that tapers to zero emissions from new vehicles by 2035 at the latest, Australia will lock in significant health benefits and lower the national healthcare spend through a reduction in harmful air pollution in our cities and towns.

This will reduce air pollution by promoting the use of cleaner technologies, such as more efficient petrol and diesel engines as well as higher uptake of electric vehicles. The higher the efficiency, the less CO<sub>2</sub> emissions are produced.

More efficient vehicles also pump out fewer other pollutants caused by the burning of petrol and diesel, such as nitrogen oxides (NO<sub>x</sub>); particulate matter (PM<sub>2.5</sub> & PM<sub>10</sub>) - tiny particles ranging in size from 2.5 to 10 micrometers that can penetrate into the lungs and bloodstream causing a

range of health problems; carbon monoxide (CO), sulfur oxides (SO<sub>x</sub>) and other volatile organic compounds (VOC) (Grattan Institute, 2021a). Electric vehicles contribute less particulate matter than petrol or diesel cars, and have zero toxic tailpipe pollution (NO<sub>x</sub>, hydrocarbons and carbon monoxide) (European Public Health Alliance, 2021).

Fuel efficiency standards also reduce the quantity of NO<sub>x</sub> and VOC released into the air which contributes to ground-level ozone pollution (such as smog). Ozone is most likely to reach unhealthy levels on hot sunny days and can lead to respiratory problems, especially in children and the elderly (Environment Protection Agency, 2022).

The International Council on Clean Transportation estimates that transport-related air pollution caused an economic cost of about \$10 billion in Australia in 2015 (Grattan, 2021a).

### *Cheaper petrol costs to reduce cost of living pressures*

Research by Solar Citizens has found that a fuel efficiency standard aligned with the EU settings (95g CO<sub>2</sub>/km for light vehicles) would save Australian drivers \$11.2 billion dollars in fuel costs over the next five years. The financial benefits of a strong Fuel Efficiency Standard would be greater for regional drivers (compared to city drivers) due to longer average commutes, higher regional fuel prices and higher rates of car ownership (Solar Citizens, 2023).

Australian drivers have long commutes and are paying high prices for fuel, yet currently drive some of the least fuel-efficient vehicles in compatible markets due to lack of fuel efficiency standards (Smit et al., 2019). One of the immediate benefits of making cars more fuel-efficient is that the average new car will consume less fuel to drive the same distance, lowering fuel bills and helping Australians tackle cost of living pressure.

Adopting a fuel efficiency standard aligned with New Zealand would see the efficiency of new vehicles sold in Australia improve 42 percent by 2026<sup>1</sup>. A 42 percent reduction would cut the average weekly fuel bill from \$98.31 to \$57.02 dollars a week - delivering a fuel cost saving of more than \$2,100 each year. The money saved will create more economic opportunities in our local communities by reducing the amount of money flowing offshore to fossil fuel

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<sup>1</sup> Assuming an improvement in emissions from 146.5 g CO<sub>2</sub>/km in Australia today, to the NZ target of 84.5g CO<sub>2</sub>/km by 2026. Australian average emissions intensity in 2021 available at: [Light vehicle emissions intensity in Australia | National Transport Commission](#) and NZ targets available at: [Data, values and formulas | Waka Kotahi NZ Transport Agency](#)

giants. In this way, fuel efficiency standards will keep more money here at home, supporting the community and local businesses.

### *More models and more choice for Australian drivers*

Delivering a strong fuel efficiency standard will see a greater range of car models become available for Australian consumers. This includes both electric vehicles and more efficient petrol and diesel vehicles which are cheaper to run and produce less harmful carbon pollution.

Internationally, car manufacturers have to supply plenty of these lower and zero emission vehicles to other markets to meet fuel efficiency standards and avoid penalties. But in Australia, there is currently no incentive for them to do so because we don't have comparable standards. This is denying Australians the choice of great new vehicles that are on offer in other markets.

In late 2022, there were only 45 electric car models available for sale in Australia (Electric Vehicle Council, 2022). This compares with 80 in the UK, 184 in the EU, and 300 models in China as of October 2022. The lack of models and low sales figures also means Australians are likely paying more than we should for new lower and zero emissions vehicles.

### *Boosting energy security*

Fuel efficiency standards have a role to play in strengthening Australia's energy security by reducing our reliance on foreign oil and vulnerability to oil supply chain disruptions.

Australia consumed more than 57 billion litres of fuel in 2022 (Australian Petroleum Statistics, 2022). More than 90 percent of this was either imported from overseas or refined from imported crude oil (The Australia Institute, 2022).

The transportation of oil and other petroleum products can be risky, with potential for spills, accidents, supply shocks and risks to international shipping lanes. By reducing the overall demand for oil and the need for transportation of petrol products, fuel efficiency standards can help to minimise these risks and improve our national security.

Australia is particularly vulnerable to petroleum supply chain shocks, a risk brought sharply into focus in recent years. We are vulnerable because only two local refineries remain and they produced less than 15 billion litres of fuel in 2022, far below total demand (Toscano, 2023). Domestic storage is

limited too, Australia has only enough reserves to meet 21 days of diesel usage and 29 days of petrol on average (Australian Petroleum Statistics, 2022).

### *Improving vehicle safety*

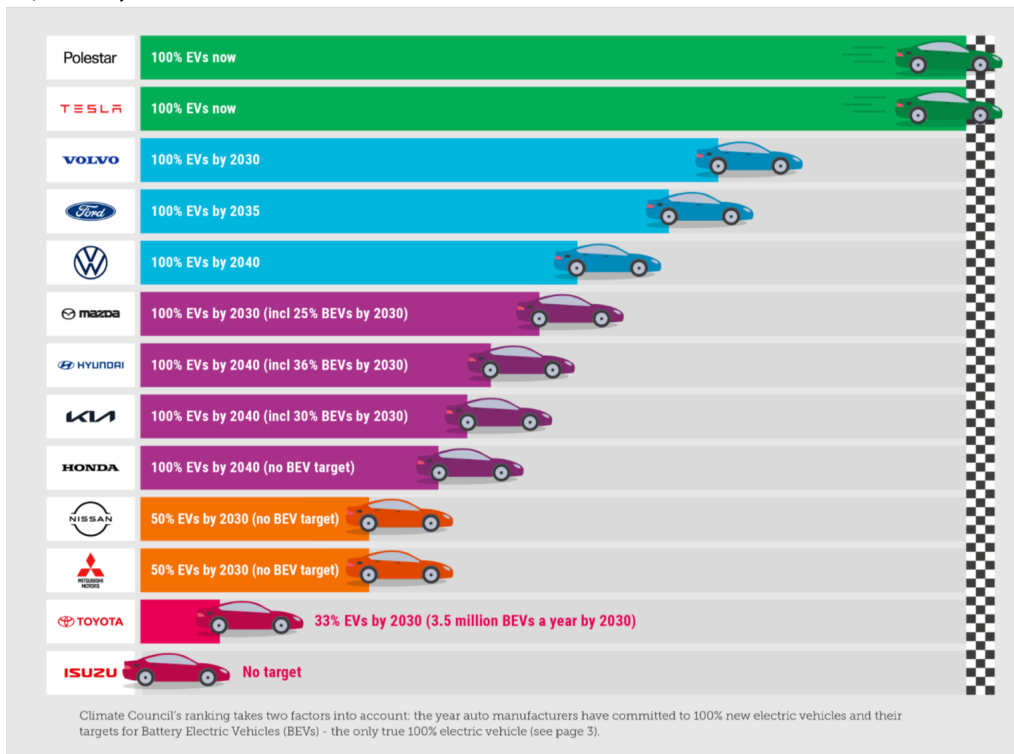
If Australia implements a strong fuel efficiency standard, car manufacturers will send more of their newest models with the latest safety technology to our market. As these new models replace older and less advanced models, Australia's fleet will become safer overall. The newest models feature up-to-date safety technology like autonomous emergency braking, advanced driver assistance systems, lane departure warning systems, adaptive cruise control, following distance warning, adaptive headlights, fatigue warning and blind spot monitoring as standard. All of these features can help reduce accidents on Australia's roads and continue driving down our national road toll. Australia should not be a dumping ground for older model cars simply because our policies are lagging behind other countries.

### **A major shift is underway in auto manufacturing**

Since the end of domestic auto manufacturing in 2017, all vehicles sold in Australia are manufactured overseas. This means the range and type of vehicles available is dependent on trends and manufacturer choices internationally. Fortunately, there is a major shift underway across the auto market, with rapid acceleration of the supply of lower and zero emission vehicles. The Climate Council's *Race to Zero Emissions* scorecard (2022) highlighted that a range of major international manufacturers are rapidly transitioning their fleets and have set strong targets for full electrification by the middle of the next decade or earlier. Some brands are clearly lagging - whether due to company philosophy or misguided prior investment choices - but as the world rapidly moves towards net zero these manufacturers will have little choice but to catch up.

This is the case not only for light passenger vehicles, but also for light commercial vehicles like utes. Almost all of Australia's top-selling utes are made in Thailand, including the Toyota HiLux, Ford Ranger, Nissan Navara, Holden Colorado, Mazda BT-50, Mitsubishi Triton and Isuzu D-Max 13. Thailand, the top vehicle supplier in South East Asia, is aiming for 50 percent of vehicles the country manufactures to be electric by 2030, reaching 100 percent by 2035. The Thai Government is investing heavily in incentives for EV producers to help realise this ambition. This is just one example of how trends and targets abroad will rapidly shift the types of vehicles available in Australia.

**Figure 1: Fleet transition commitments of the top-selling automakers in Australia (Climate Council, 2022a)**



### Cleaner and cheaper-to-run vehicles are already available

In designing a fuel efficiency standard, it will be important to consider the diversity of Australians' transport needs and the accessibility of suitable vehicles to meet these. Many Australians are keen to buy a zero emissions vehicle and would find these suitable for their needs. Others may continue to choose a petrol or diesel vehicle in the near-term, and would benefit from being able to buy a more efficient model which is cheaper and cleaner to run.

Analysis of current new vehicle models available in Australia shows there is already considerable variation in the efficiency of passenger and light commercial vehicles sold. For example, if all cars sold in 2021 were 'best in class' for emissions, Australia's total 2021 emissions would have reduced by 91 percent for passenger vehicles and small SUVs, and 47 percent for larger SUVs and utes (National Transport Commission, 2022). Similarly, if all Australians who bought one of the top-selling utes in the 12 months to October 2022 had instead opted for the lowest emitting model, they would have collectively saved a total of \$42 million in fuel costs and avoided over 87,300 tonnes of CO<sub>2</sub> emissions (Climate Council, 2023a).



**Figure 2: Existing variation in fuel efficiency across vehicle types**

Make and model	Most efficient ICE		Least efficient ICE		EV models available for each vehicle class
	\$ annual fuel cost	g co2 / km	\$ annual fuel cost	g co2 / km	
<b>Passenger cars</b>					
Hatch	Fiat Easy Panda 0.9 Turbo Twin Air 2cyl (2013) Petrol 95RON		Citroen C3 Shine 3cyl (2019) Petrol 95RON		62 BEV, 13 PHEV, 13 Electric/Petrol
	1033	95	1310	118	
Sedan	Fiat Hardtop D/L 500 0.9 Twin Turbo Air 2cyl (2012) Petrol 95RON		Fiat 500 1.2 8V Manual 4cyl (2013) Petrol 95RON		49 BEV, 31 PHEV, 6 Electric/Petrol
	983	90	1285	119	
Wagon	MINI F60 Mini Cooper Countryman 3cyl (2019) Petrol 95RON		Audi Q5 2.0 TFSI quattro Tiptronic 4cyl (2013) Petrol 95RON		40 BEV, 24 PHEV, 15 Electric/Petrol, 3 Electric/Diesel
	1210	57	1991	184	
<b>SUVs</b>					
Small and medium SUV (small and medium)	Citroen Cactus MT5 3cyl Turbo (2016) Petrol 95RON		Skoda MY20 Kmiq 85TSI 3cyl (2020) Petrol 95RON		15 BEV, 4 PHEV, 2 Electric/Petrol
	1184	107	1285	116	
Heavy SUV (large, offroad and peplemover)	Peugeot 5008 GT Sport 4cyl (2022) Petrol 95RON		Land Rover L560 Range Rover Velar PT204 184kW 4cyl (2022) Petrol 95RON		33 BEV, 64 PHEV, 11 Electric/Petrol, 18 Electric/Diesel
	1411	128	1966	182	
<b>Light commercial vehicles</b>					
Vans	Peugeot Partner Petrol Manual Standard 3cyl (2019) Petrol 95RON		Renault PhII Kangoo 4cyl (2016) Petrol 95RON		6 BEV
	1487	130	2066	190	
Utes and cab-chassis	Nissan D23 NP300 Navara 4x2 Twin Turbo 4cyl (2015) Diesel		Mercedes-Benz 470 X Class X250d 4WD Power 4cyl (2018) Diesel		N/A on Green Vehicle Guide (LDV eT60 is for sale)
	1411	166	1725	203	

Data sourced from the Green Vehicle Guide years "2013" to "2023". For all vehicle types only fuel type: Petrol 95 RON was examined for consistency (except ute and cab-chassis as the only fuel type consisted of diesel). Note: data on most and least efficient ute differs from Climate Council's Ute Beauty report as additional manual searching was conducted for this report to identify efficiency of vehicle types reported as sold via the VFACTS database which do not appear in the Green Vehicle Guide.

A strong fuel efficiency standard can incentivise manufacturers to bring more of the most efficient vehicles to Australia across all vehicle classes. This will benefit all local drivers, regardless of which type of new vehicle they choose to buy.

In the following submission, the Climate Council has responded in detail to the discussion questions outlined in the consultation paper '[Fuel Efficiency Standard: Cleaner, cheaper to run cars for Australia](#)'. A summary of our recommendations is below; we would welcome the opportunity to discuss these further with the Department as the detailed design of a strong fuel efficiency standard for Australia is progressed.

## Summary of recommendations

### Recommendation 1

The Climate Council recommends the proposed guiding principles be made more explicit regarding the concrete outcomes that will be pursued through the policy design process, and particularly set out overarching goals of:

- a trajectory consistent with seeing 100 percent of new vehicles sold be zero emissions as soon as possible and by 2035 at the latest;
- aligning with comparable markets on the headline target for grams of CO<sub>2</sub> per kilometre emitted;
- minimising the use of credits and other flexibility mechanisms which can undermine the effectiveness and transparency of the standard.

### Recommendation 2

The Climate Council recommends the majority of the chosen fuel efficiency standard settings be placed in primary legislation for transparency, and to embed ongoing certainty.

### Recommendation 3

The Climate Council recommends the Australian Government address the full suite of technology, policy and behaviour change considerations underpinning the decarbonisation of transport in Australia, and deal with emissions from transport modes beyond light vehicles, as part of the development of a comprehensive National Transport Decarbonisation Plan.

#### **Recommendation 4**

The Climate Council recommends the annual emissions ceiling be set on a trajectory consistent with achieving 100 percent of new vehicles sold being zero emissions by 2035 from commencement of Australia's fuel efficiency standard and remain on that trajectory throughout its implementation.

#### **Recommendation 5**

The Climate Council recommends the average annual emissions ceiling be set to align with other comparable markets on the **headline target**, not simply the annual average rate of decline.

#### **Recommendation 6**

The Climate Council recommends the adoption of either a 'start strong' approach or a 'linear' approach for all vehicle categories if a twin trajectory design is intended. We caution against adopting a 'mixed start' approach which sets different trajectories for different vehicle classes.

In setting a starting point for the average annual emissions ceiling, the Climate Council calls attention to the current range of lower emission/higher efficiency vehicles available in the Australian market. The starting point for an Australian standard should reflect the best available current performance for internal combustion vehicles - not the overall average performance for all vehicles.

#### **Recommendation 7**

The Climate Council recommends the average annual emissions ceiling be reviewed after the first three full years of implementation, and at equivalent intervals after that.

#### **Recommendation 8**

The Climate Council recommends the legislation establishing a fuel efficiency standard explicitly state that any future adjustments to the average annual emissions ceiling may *increase* the rate of transition, but may not *reduce* it.

#### **Recommendation 9**

The Climate Council recommends the decision on whether to adopt a single or twin trajectory design for Australia's fuel efficiency standard be

guided by the goal of achieving the maximum possible emissions reduction in the years to 2035.

If a twin trajectory approach is initially adopted, the Climate Council notes it will be essential for all vehicle classes to achieve 0 g CO<sub>2</sub>/km by 2035 at the latest, regardless of the initial slope of the transition trajectory for each.

### **Recommendation 10**

The Climate Council recommends the Australian Government end tax policies which currently incentivise the purchase of larger, heavier and higher-emitting vehicles such as the Fringe Benefits Tax exemption and the Instant Asset Write-Off approach, in parallel with designing and implementing a strong fuel efficiency standard.

### **Recommendation 11**

The Climate Council recommends that any banking, transferring and pooling of credits be implemented subject to the requirement that existing credits may only be banked, transferred, pooled or otherwise carried forward within each legislated review period.

### **Recommendation 12**

The Climate Council recommends the use of 'super credits' be avoided to the greatest extent possible in designing an Australian fuel efficiency standard. If super credits are to be provided anywhere within the policy design, they should be limited to vehicle types and technologies which are still genuinely at a nascent stage of development.

Super credits should not be made available for entire classes of vehicle technology (e.g. battery electric vehicles) or model types where there are suitable alternatives readily available (e.g. heavier passenger SUVs not suited to offroad and work uses).

### **Recommendation 13**

The Climate Council recommends manufacturers should ideally not be eligible for off-cycle credits of any kind. If off-cycle credits are to be included in some form, their use should be capped at a low, per vehicle level. Any technologies supplied as standard in other markets at the time of commencement for Australia's fuel efficiency standard should not be eligible for off-cycle credits.

### **Recommendation 14**

The Climate Council recommends the use of high global warming refrigerants be banned outright in Australia if they are of sufficient concern to warrant policy intervention. Manufacturers should not be able to earn credits by avoiding their use.

### **Recommendation 15**

The Climate Council recommends the total benefit a vehicle manufacturer can receive through use of credits - super credits, off-cycle credits and any others - should be capped at a low level to ensure integrity of the policy framework.

### **Recommendation 16**

The Climate Council recommends the enabling legislation for a fuel efficiency standard be introduced to Parliament before the end of 2023, with passage during early 2024. This would allow the policy to commence on 1 July 2024.

Following commencement on 1 July 2024, the average annual emissions ceiling settings could then be determined on a financial year basis. This aligns with both the business year for financial and corporate reporting purposes, and other major emissions reporting frameworks.

### **Recommendation 17**

The Climate Council recommends penalties be set at a sufficient level to drive genuine compliance. It is consistent with regulatory practice across government that stronger penalties will better incentivise compliance and therefore support increased supply of lower and zero emission vehicles.

### **Recommendation 18**

The Climate Council encourages the Department to also consider implementing 'anti-avoidance' rules and associated penalties as part of the design of an Australian fuel efficiency standard, to further incentivise genuine compliance and a level playing field for all participants.

### **Recommendation 19**

The Climate Council recommends the information disclosure requirements underpinning an Australian fuel efficiency standard be designed with effective implementation of the framework and achievement of positive

outcomes for the community in mind - not minimising regulatory requirements for manufacturers.

### **Recommendation 20**

The Climate Council recommends manufacturers be required to report in detail on their use of credits in each compliance period. This reporting should be made in a standard format determined by regulators, and cover the use of any credits available, broken down by volume and category.

### **Recommendation 21**

The Climate Council recommends the regulator for an Australian fuel efficiency standard be tasked with aggregating and making available free, public, frequent, granular and reliable data about vehicle sales on an annual basis.

## 2. Guiding principles

The Climate Council has identified five key design principles for a strong fuel efficiency standard that will benefit all Australians. The fuel efficiency standard should:

1. Set Australia on a strong pathway to a zero emissions fleet – with a trajectory that will see all new vehicles sold being zero emissions as soon as possible and by 2035 at the latest
2. Align with other car markets like New Zealand, the United States and Europe as a minimum – so Australia moves up the queue for cleaner, cheaper vehicles
3. Deliver genuine reductions in emissions from new cars sold in Australia – avoiding credits and loopholes that undermine their effectiveness
4. Be mandatory and legislated – auto manufacturers should not be able to opt out
5. Start as soon as possible – every new vehicle sold today will likely be on the road for at least the next 10 to 15 years, so we cannot delay.

These principles are broadly consistent with the guiding principles outlined in the Department's discussion paper. We offer the following commentary on how the two should be aligned in practice and made more explicit for the purpose of informing detailed policy design and implementation.

***Effective in reducing transport emissions from light vehicles. The purpose of a FES is to reduce the average amount of CO<sub>2</sub> emitted by Australia's new light vehicle fleet over time, which is broadly consistent with the FESs in place in major advanced markets.***

Australia has lagged behind other markets in introducing a fuel efficiency standard, so we will need to take strong steps to catch up. This will require moving to match the headline emissions ceiling for grams of CO<sub>2</sub> per kilometre (g CO<sub>2</sub>/km) in other key jurisdictions as quickly as possible, not just the annual rate of emissions decline (Climate Council Principle 2). If Australia only seeks to match the annual rate of emissions decline but not the headline emissions ceilings used in other markets, we will remain at the back of the queue for the cleanest and cheapest-to-run vehicles. To ensure the Australian fuel efficiency standard is genuinely effective, the design will also need to minimise the use of credits and other flexibility mechanisms for manufacturers (Climate Council Principle 3). See further discussion under ***Transparent*** below.

***Equitable*** so all Australians can access the vehicles they need for work and leisure. The cars that we drive are a critical part of how Australians live and work, and need to be practical. The Australian FES will need to be equitable and not unduly negatively impact any particular group of people or part of Australia.

Australians are currently paying more for fuel and experiencing a range of negative health and environmental impacts that come with our highly polluting vehicle fleet. An equitable policy would ensure all Australians have access to the lowest emitting and cheapest-to-run vehicle that meets their needs – whether this is an electric vehicle, a hybrid or a very efficient petrol or diesel vehicle. Manufacturers are already producing these vehicles for other markets around the world and Australians at all income levels should have the opportunity to access these – currently, they do not. Setting Australia on a clear pathway to a zero emissions fleet (Climate Council Principle 1) through the design of the fuel efficiency standard can improve equity by ensuring manufacturers make a range of vehicles available at prices more Australians can afford.

***Transparent*** and well explained to avoid unintended consequences. The details of an Australian FES will need to be accessible, whilst available in sufficient granularity and predictability to allow industry to make good long-term investment decisions, and not unduly increase red tape.

A transparent fuel efficiency standard is one which delivers real-world outcomes aligned with the target annual average emissions ceiling. That is, the average emissions intensity of each manufacturer's fleet sold in Australia must genuinely align with the ceiling set out by government. International experience has shown that the use of crediting arrangements and other flexibility mechanisms can significantly undermine the achievement of real-world emissions reduction (see discussion under *Manufacturer flexibility arrangements*, p.26). Australia has the opportunity to learn from the prior experience of other markets, to design a policy which avoids these unintended consequences by limiting the use of credits and other loopholes for manufacturers (Climate Council Principle 3).

***Credible*** and ***robust*** by drawing on expert analysis and experience. We want Australia's FES to be designed with the latest and best analysis available, drawing on the expertise of industry, the environmental community, academia and others.

The International Energy Agency has identified that sales of new internal combustion engines must cease by 2035 for the world to achieve net zero emissions by 2050 (International Energy Agency, 2022). This finding has been reinforced by a range of other analysts, and is based on the



understanding that every new vehicle sold in a given year remains on the road for 15 to 20 years (see for example, Grattan Institute, 2021b). For Australia's fuel efficiency standard to be aligned with the 'latest and best analysis available', it must therefore incorporate as a core design principle a trajectory consistent with seeing 100 percent of new vehicles sold be zero emissions by 2035 at the latest (Climate Council Principle 1). There is also extensive international evidence about the impact of crediting and flexibility arrangements on undermining the effectiveness of fuel efficiency standards adopted internationally, which should be taken into account in limiting their use in the Australian context (Climate Council Principle 3).

***Enable** vehicles with the best emissions and safety technology to be available to Australians. It is important that Australians have access to the best and latest vehicle technology, as good as or better than what is available internationally. We want to avoid increasing the average age of vehicles in the fleet so there are no inadvertent safety impacts.*

Manufacturers will only be incentivised to bring vehicles with the best emissions and safety technology to Australia if our fuel efficiency standard is at least as strong as those in place internationally. As noted above under **Effective** this will require moving to match the headline average annual emissions ceiling for g CO<sub>2</sub>/km as quickly as possible, not just the annual rate of emissions decline (Climate Council Principle 2). Australia has the opportunity to take the best elements of existing standards in place around the world to design a standard that enables positive outcomes for carbon pollution, vehicle safety and cost of living.

### **Recommendation 1**

The Climate Council recommends the proposed guiding principles be made more explicit regarding the concrete outcomes that will be pursued through the policy design process, and particularly set out overarching goals of:

- a trajectory consistent with seeing 100 percent of new vehicles sold be zero emissions as soon as possible and by 2035 at the latest;
- aligning with comparable markets on the headline target for grams of CO<sub>2</sub> per kilometre emitted;
- minimising the use of credits and other flexibility mechanisms which can undermine the effectiveness and transparency of the standard.

### 3. Design assumptions

The Climate Council broadly agrees with the design assumptions outlined in the Department's consultation paper, being that an Australian fuel efficiency standard will:

- **Apply only to vehicles entering the Australian market for the first time.** *The Australian FES will only apply to new vehicles, whether imported or manufactured domestically. It will not apply to vehicles in the domestic used car market.*
- **Apply on average to vehicles sold.** *The Australian FES will protect the continued sale of vehicles Australians love, including utes and 4-wheel drives and will work to lower average emissions over time. A FES will provide good incentives for suppliers to provide more efficient internal combustion engine technology, including hybrids, and bring popular and more affordable LZEVs to Australia to reduce the average emissions of new vehicle sales. A FES will continue to allow the full range of vehicles to be sold on the Australian market.*
- **Apply to light vehicles.** *This consultation is only investigating a FES for light vehicles. The FES will not apply to heavy vehicles, vehicles for military, law enforcement and emergency services use, agricultural equipment or motorcycles.*
- **Apply to vehicle suppliers, not motor vehicle dealers.** *We want the FES to apply to the entity with the greatest control over the vehicles and vehicle technology which are supplied to, and sold in, the Australian market.*
- **Be mandatory.** *The Government does not intend to introduce a voluntary FES.*
- **Be established in Commonwealth legislation.** *To be effective, an Australian FES must have robust, enforceable, Commonwealth legislation that contains mechanisms to reduce the administrative burden as far as possible, and include mechanisms to minimise avoidance.*
- **Consider vehicle affordability, lifetime cost and model availability.** *We want to learn from best practice FESs in other major markets, and make sure that Australians can still get the cars they need. (Department of Infrastructure, Transport, Regional Development and Local Government, 2023)*

We applaud the Government's commitment to introduce a mandatory framework, as there is clear evidence that Australia's voluntary standard developed by the Federal Chamber of Automotive Industries has not been effective at reducing transport emissions or improving availability of lower and zero emissions vehicles (FCAI, 2023).

Establishing the standard through legislation is also an important step because this will ensure that the policy has a durable foundation to give industry certainty. The Climate Council encourages the Department to place the majority of policy settings in primary legislation for transparency and to further embed ongoing certainty. Associated regulations may be needed for technical settings or those where a degree of legislative flexibility is warranted, but all key policy settings should be established in primary legislation.

The Climate Council recognises that the Australian Government is currently focused on driving down emissions from the light vehicle fleet, as the largest total share of transport emissions. Recent analysis indicates there are also significant emissions reduction opportunities in improving the efficiency of the medium and heavy transport fleet. For example, electrifying 10 vehicles used for delivery purposes can achieve the same emissions reduction as transitioning 56 personal vehicles to electric (Adiona Tech, 2023). For this reason, we recommend the Australian Government consider whether a separate fuel efficiency standard for medium and heavy vehicles is required, along with other measures to drive the decarbonisation of Australia's full transport fleet. This should also address emissions from Australia's public transport road fleet, where diesel buses are currently the norm. Although state and territory governments have commenced replacement of these buses with zero emissions battery electric and hydrogen alternatives, currently-announced investment plans are too slow to achieve significant emissions reduction this decade, and would benefit from a coordinated national approach.

These issues could be considered as part of the development of a comprehensive National Transport Decarbonisation Plan, as recommended in the Climate Council's submission to the National Electric Vehicle Strategy consultation (Climate Council, 2022b). We note that the Australian Government has funded development of such a plan in the 2023-24 Commonwealth Budget, and would encourage measures to reduce emissions from the medium, heavy and public transport fleets be considered as key actions within that plan.

## **Recommendation 2**

The Climate Council recommends the majority of the chosen fuel efficiency standard settings be placed in primary legislation for transparency, and to embed ongoing certainty.

### **Recommendation 3**

The Climate Council recommends the Australian Government address the full suite of technology, policy and behaviour change considerations underpinning the decarbonisation of transport in Australia, and deal with emissions from transport modes beyond light vehicles, as part of the development of a comprehensive National Transport Decarbonisation Plan.

## **3. FES design features**

The initial settings chosen for an Australian fuel efficiency standard will determine the policy's success or failure. Australia only has 12 years to fully transition new vehicle sales to fully zero emissions vehicles to meet the legislated 2050 net zero target, so there is no time to waste. The Climate Council's recommendations below focus on settings which can see Australia achieve this objective for new vehicles sold. It must be noted that this is not the only measure that will be needed to decarbonise personal transport during the years to 2035. The Climate Council has also undertaken significant analysis on the potential for uptake of public and active transport to dramatically cut emissions using technology available today (Climate Council, 2023b). Transitioning our vehicle fleet is just one part of a broader structural shift required in how Australians move around in a zero emissions world.

### **Average annual emissions ceiling**

The key principle that must inform the setting of the average annual emissions ceiling is the objective of seeing 100 percent of new vehicles sold be zero emissions by 2035 at the latest.

This objective must be met across all light vehicle categories (passenger and commercial) for Australia to be on an emissions reduction trajectory consistent with achieving net zero economy wide by 2050. The Climate Council notes that a science-aligned target would see Australia reach net zero significantly earlier than this date, so 2035 should be considered the absolute outer limit of an acceptable trajectory for light vehicles. The annual emissions ceiling should be set on a trajectory consistent with achieving 100 percent of new vehicles sold being zero emissions by 2035 from commencement, and remain on that trajectory throughout the intervening years.

A second key principle for setting the average annual emissions ceiling is that it must align with other comparable markets on the headline target set, not simply on the annual average rate of decline. Discussion among manufacturers has sought to frame an acceptable standard as one which achieves the same annual rate of decline in g CO<sub>2</sub>/km as other comparable markets like the European Union, United States of America and New Zealand. The average range of annual decline rates in these markets is 3.64 to 10.09 percent a year for passenger cars and 1.09 to 10.81 percent a year for LCVs<sup>2</sup>. It is important to note that countries with a lower rate of decline have had fuel efficiency standards in place for at least a decade (the European Union and USA for example), while New Zealand has a higher rate of decline as their standard was only recently introduced.

However, if Australia does not commence with a headline target which is also comparable with other markets, simply matching the annual rate of decline will mean our standard never ‘catches up’ to these counterparts. Table 1 below outlines the headline targets currently in place in other key comparison markets. Australia must progressively seek to align its headline target *and* annual rate of decline with these markets in coming years, otherwise it will not be possible to achieve the objective of seeing 100 percent of new vehicles sold being zero emissions by 2035 at the latest. In 2021 the average emissions intensity for passenger cars and light SUVs in Australia was 146.5g CO<sub>2</sub>/km, and 212.5g CO<sub>2</sub>/km for heavy SUVs and light commercial vehicles (National Transport Commission, 2022). As Figure 3 below notes, this is significantly higher than key comparison markets like the European Union.

**Figure 3: Fuel efficiency standard settings currently in place in key comparison markets**

Country	New Zealand	European Union	United States
<b>Current average CO<sub>2</sub> emissions</b>	158.8g CO <sub>2</sub> /km passenger cars (2021)  242.9g CO <sub>2</sub> /km light commercial vehicles (2021)	109g CO <sub>2</sub> /km passenger cars (2020)  153.5g CO <sub>2</sub> /km vans (2020)	128.4g CO <sub>2</sub> /km passenger cars (2019)  185.5 g CO <sub>2</sub> /km light commercial vehicles (2019)

<sup>2</sup> Noting that this rate of decline only takes into account when a standard was put in place and the end date differs depending on each country’s commitments. EU passenger standard from 145.7 g CO<sub>2</sub>/km in 2009 to 0 g CO<sub>2</sub>/km in 2035; LCV standard from 179 g CO<sub>2</sub>/km in 2011 to 0g CO<sub>2</sub>/km in 2035. US passenger standard from 161.6g CO<sub>2</sub>/km in 2012 to 44.0g CO<sub>2</sub>/km in 2032; LCV standard from 229.9g CO<sub>2</sub>/km in 2012 to 179.8g CO<sub>2</sub>/km in 2032. In the 2027-2032 US EPA has proposed to expand the LCV category, hence the small decline rate. NZ passenger standard from 158.8g CO<sub>2</sub>/km in 2021 to 62.7g CO<sub>2</sub>/km in 2027; LCV standard from 242.9g CO<sub>2</sub>/km in 2021 to 85.3g CO<sub>2</sub>/km in 2027 (ICCT, 2023a).

<b>Passenger vehicle target for 2025</b>	112.6g CO <sub>2</sub> /km	95g CO <sub>2</sub> /km (2020-2024) Cars	91.1g CO <sub>2</sub> /km
<b>Light commercial vehicle target for 2025</b>	155g CO <sub>2</sub> /km	147g CO <sub>2</sub> /km (2020-2024) Vans	132g CO <sub>2</sub> /km
<b>Strongest target set</b>	Passenger: 63.3g CO <sub>2</sub> /km  Light commercial vehicle: 87.2g CO <sub>2</sub> /km (2027)	0g CO <sub>2</sub> /km all (2035)	Light duty vehicles (including passenger cars and light trucks): 44g CO <sub>2</sub> /km  Medium duty vehicles (heavy duty pickups and vans): 179.8g CO <sub>2</sub> /km (2032) <sup>3</sup>

Data sourced from: ICCT (2023a); US EPA (2023b); European Commission (2021); and New Zealand Ministry of Transport (n.d).

The Department has sought feedback on whether the average annual emissions ceiling should be set using a ‘start strong’, ‘straight line’ or ‘strong finish’ approach. The Climate Council has commissioned modelling to explore the aggregate emissions reduction potential achieved by these different approaches. We would be happy to provide the detailed modelling analysis and underlying workings directly to the Department to inform the ongoing policy design process.

The modelling assumed a twin trajectory approach is adopted for light passenger and light commercial vehicle fleets, consistent with the approach used overseas. As noted in the further discussion of this design feature below (see **Vehicle classes and targets** p.24), a single trajectory is the optimum policy design to maximise potential emissions reduction and avoid unintended consequences through changes in fleet composition. However, if a twin trajectory approach is adopted, the modelling highlights several useful points about the optimum design:

<sup>3</sup> In the US settings for 2023-2026, Passenger cars include cars and smaller crossovers and SUVs, while the truck category includes larger crossovers and SUVs, minivans, and pickup trucks (US EPA, 2021). In the updated 2027-2032 proposed standards, light duty vehicles include passenger cars and light trucks, while medium duty vehicles (a new category introduced) includes primarily large pickups and vans (US EPA, 2023a).

- A 'start strong' approach for both vehicle categories delivers the greatest aggregate emissions reduction;
- A 'strong finish' approach for both vehicle categories delivers the least aggregate emissions reduction;
- A 'mixed start' approach using a 'start strong' trajectory for light passenger vehicles and a 'strong finish' trajectory for light commercial vehicles has the potential to outperform both a 'straight line' and 'strong finish' approach in the amount of aggregate emissions reduction achieved. However, this outcome is highly vulnerable to changes in fleet composition. There is the potential for aggregate emissions to be significantly higher than in other scenarios if there is a shift towards the sale of heavier and larger vehicles.

On this basis, the Climate Council recommends the adoption of either a 'start strong' approach or a 'linear' approach for all vehicle categories in a twin trajectory design. We strongly caution against adopting a 'mixed start' approach which sets different trajectories for different vehicle classes, as this has the potential to significantly reduce the aggregate emissions reduction ultimately achieved as a result of changes in fleet composition.

In determining the appropriate starting point for a target average annual emissions ceiling, the Climate Council also calls the Department's attention to the current range of lower emission/higher efficiency vehicles available in the Australian market. As highlighted in Figure 2 on p.9, the current range of grams CO<sub>2</sub> per kilometre for the most efficient light passenger vehicles and SUVs is 57 to 107g CO<sub>2</sub>/km depending on vehicle type. For heavier SUVs, utes and vans, the range is 128 to 166g CO<sub>2</sub>/km for the most efficient vehicles. The starting point for an Australian standard should therefore reflect the best available current performance for internal combustion vehicles - not the overall average performance for all vehicles. Manufacturers should not have difficulty meeting a standard set at this level, given it reflects currently available technology for internal combustion engines.

Figure 4 (overleaf) highlights the significant aggregate emissions reduction benefit which could be achieved by commencing the target average annual emissions ceiling at a level approximately equivalent to current best-in-class performance for internal combustion vehicles, as compared with the fleet average.<sup>4</sup>

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<sup>4</sup> Estimated starting rates for best-in-class ICE performance reached by averaging current best-in-class performance across vehicle categories identified in Figure 2.

**Figure 4: Comparison of aggregate emissions reduction potential based on different headline starting rates**

Scenario	Light passenger + light SUV start	Light passenger + light SUV end	Light commercial + heavy SUV start	Light commercial + heavy SUV end	Aggregate emissions 2024-2060 (mt CO <sub>2</sub> )
Linear to 2035, stable fleet composition	145 in 2024	0 in 2035	210 in 2024	0 in 2035	712,326,574
Linear to 2035, stable fleet composition	98 in 2024	0 in 2035	142 in 2024	0 in 2035	613,117,488
<b>Difference</b>					-99,209,086

#### **Recommendation 4**

The Climate Council recommends the annual emissions ceiling be set on a trajectory consistent with achieving 100 percent of new vehicles sold being zero emissions by 2035 from commencement of Australia’s fuel efficiency standard and remain on that trajectory throughout its implementation.

#### **Recommendation 5**

The Climate Council recommends the average annual emissions ceiling be set to align with other comparable markets on the **headline target**, not simply the annual average rate of decline.

#### **Recommendation 6**

The Climate Council recommends the adoption of either a ‘start strong’ approach or a ‘linear’ approach for all vehicle categories if a twin trajectory design is intended. We caution against adopting a ‘mixed start’ approach which sets different trajectories for different vehicle classes.

In setting a starting point for the average annual emissions ceiling, the Climate Council calls attention to the current range of lower emission/higher efficiency vehicles available in the Australian market. The starting point for an Australian standard should reflect the best available current performance for internal combustion vehicles - not the overall average performance for all vehicles.



## Adjustments of average annual emissions ceiling

The Climate Council acknowledges that it will be important for the average annual emissions ceiling to be regularly reviewed and adjusted along the journey to 2035. In recent years there has been a very rapid acceleration of the production of low and zero emission vehicles and their uptake by buyers around the world. The global market for ICE passenger vehicles peaked in 2017 at 86 million vehicles sold and is now considered to be in structural decline (Bloomberg, 2023). In 2017, one in every 70 passenger cars sold globally was an EV. In 2022, this increased to one in seven (World Economic Forum, 2023). This trend is expected to accelerate - not least by manufacturers themselves, with automakers increasingly setting clear pathways for fully transitioning their fleets to zero emission vehicles (Climate Council 2022a). In this context, settings should be reviewed as regularly as possible while balancing considerations about forward policy certainty for manufacturers.

The Climate Council recommends the settings be reviewed after the first three full years of implementation, and at equivalent intervals after that. We further recommend the fuel efficiency standard commence as soon as possible after legislative passage, on 1 July 2024. This would then establish the following minimum schedule of reviews during the years to 2035:

- First review - as soon as possible after 30 June 2027
- Second review - as soon as possible after 30 June 2030
- Final review - as soon as possible after 30 June 2033.

The Climate Council recommends these review dates be reflected in the primary legislation for the scheme, along with requirements that:

- the reviews be informed by an independent expert panel with input from the Climate Change Authority and the Department of Infrastructure, Transport, Regional Development and Local Government;
- manufacturers must submit information and data to the reviews as requested by the independent expert panel, the Authority or the Department, to ensure its findings are evidence-based - including, where relevant, information on their sales and production in other markets; and

- any adjustments to settings resulting from the reviews may *increase* the rate of transition and associated average annual emissions ceilings, but may not *reduce* this.

This final point is consistent with the approach adopted in Australia's *Climate Change Act 2022*, under which targets may 'ratchet' up but may not be adjusted lower than the initial settings. This will be important to provide certainty for auto manufacturers, other industry participants and the broader Australian community about the direction of travel and minimum speed for the transformation of our national fleet.

While Australia is a recipient of vehicles produced by overseas automakers, our policy settings can also play an important role in helping to shape the forward plans and manufacturing schedules of these corporations. The European Union, Canada, the United Kingdom and some US states are among the major markets which have already set a clear pathway for achieving 100 percent zero emission light vehicle sales by 2035. Embedding this trajectory in the design of Australia's fuel efficiency standard would help further entrench this as a global standard for manufacturers, increasing the likelihood of them meeting it in our market and others.

### **Recommendation 7**

The Climate Council recommends the average annual emissions ceiling be reviewed after the first three full years of implementation, and at equivalent intervals after that.

### **Recommendation 8**

The Climate Council recommends the legislation establishing a fuel efficiency standard explicitly state that any future adjustments to the average annual emissions ceiling may *increase* the rate of transition, but may not *reduce* it.

## **Vehicle classes and targets**

A single-track design putting all new vehicles on a single trajectory for emissions reduction would be optimum as passenger cars and light commercial vehicles have similar construction and power trains. Technologies that reduce fuel consumption and CO<sub>2</sub> emissions in passenger cars can also be applied to light commercial vehicles (ICCT, 2023b).

However, the Climate Council acknowledges that the majority of fuel efficiency standards in place around the world have adopted some form of 'twin track' trajectory for different vehicle classes. There are two general approaches in use internationally:

- *Parallel emissions targets, no aggregate target* - in this approach, light passenger vehicles (such as compacts and sedans) and light commercial vehicles (such as vans and utes) are each set a standalone average annual emissions ceiling which declines over time. These average annual emissions ceilings may eventually converge on a single point target (e.g. 0 g CO<sub>2</sub>/km by 2035) but do not aggregate to a single, weighted target before this point.
- *Parallel emissions targets, aggregated to a single target* - in this approach, light passenger and light commercial vehicles are each set an average annual emissions ceiling which declines over time. These targets then aggregate to a single weighted target for the vehicle fleet as a whole. This makes achievement of the aggregate emissions ceiling dependent on the composition of the overall new fleet sold, as well as the progress made in each vehicle class to reduce emissions.

As Australia has been slow to introduce a fuel efficiency standard, we have the opportunity to learn from the experience of other countries which have pursued this policy approach before us. The international evidence clearly illustrates that having two emissions targets for different classes of vehicles risks incentivising both production and sales to shift towards larger and heavier vehicles. In the United States for example, the light duty vehicle market has trended toward heavy SUVs in recent years and the overall fuel economy of the fleet has not significantly improved (ICCT, 2023).

Manufacturers are incentivised to take advantage of less-stringent standards and re-classify light SUVs as heavy SUVs, which ultimately weakens the overall effectiveness of the standard. Due to Australia's similarities with the US fleet composition and purchasing trends<sup>5</sup> we face similar risks. In 2021 light SUVs were approximately 41 percent of Australia's light duty fleet and heavier SUVs about 14 percent. An unintended consequence of following the US' approach is that these light SUVs could be shifted toward the heavier category.

Australia has already experienced a significant shift towards larger vehicles like utes and SUVs in recent years. For example, new ute sales have risen from 16 percent of all new car sales in 2012, to 21 percent in the 12 months to October 2022 (FCAI 2022; FCAI 2013). Heavier and larger vehicles are more

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<sup>5</sup> In Australia sales of SUVs have increased from 30 percent to 58 percent between 2012 and 2022, similar to the US which has increased from 30 percent to 56 percent over the same period (ICCT 2023b; US EPA 2022).

expensive to run, and produce more emissions both on the road and in manufacturing. Further, they are more dangerous for pedestrians and other road users, and exacerbate issues with congestion and shared use of public spaces compared with smaller vehicles. The design of Australia's fuel efficiency standard should be mindful of the evidence on perverse incentive effects seen internationally, and seek to minimise these in our local context. Developing a single fuel efficiency standard applying across vehicle classes appears to be the design approach which best addresses the risk of eroding policy effectiveness by shifting vehicle sales to the higher emission category.

It must also be acknowledged, however, that vehicle classes are at different stages of technology development at present. Internationally, there is good availability of a wide range of low and zero emission light passenger vehicles, commercial vehicles like vans and some SUVs. The availability of low and zero emissions utes and offroad vehicles is improving rapidly as more manufacturers develop product offerings in these categories. For example, by 2025 there are expected to be approximately 20 different electric ute options available internationally, based on current manufacturer announcements (Climate Council, 2023a). These vehicles are not yet widely available in Australia however; enabling infrastructure such as charging will also need to be rapidly scaled up to ensure people in regional and remote areas across the country can reliably use low and zero emission vehicles.

In this context, there may be a case for adopting a dual trajectory policy design, at least in the initial years of an Australian fuel efficiency standard. On balance, this approach could have greater overall benefits for emissions reduction and vehicle availability than one which keeps all vehicle classes together but sets a very weak annual average emissions ceiling across the board to accommodate less developed vehicle technologies.

If this approach is adopted, it will be essential that the two pathways converge to a single point of 0g CO<sub>2</sub>/km by 2035 at the latest. International expert agencies have clearly stated that sales of petrol and diesel vehicles must cease by this date for the world to achieve net zero emissions by 2050. On this basis, there is no case for a dual trajectory policy design which sees some classes of petrol and diesel vehicles continue to be sold after this time.

Fuel efficiency standards alone - whether single trajectory or dual - are unlikely to fully reverse the trend towards Australians buying larger, heavier and higher emitting vehicles. This is because there are a range of other Commonwealth policies which currently also skew purchasing decisions towards large utes and SUVs, including for drivers who may not need these for a specific work purpose. This is working counter to any emission reduction benefits won from growing EV car sales.

For example, heavy vehicles such as utes, vans and 4WDs are currently exempt from fringe benefits tax as long as they have 'limited' private use (Australian Taxation Office, 2023a). This benefit is not available for smaller, lighter and more efficient internal combustion vehicles, although a similar exemption has recently been added for electric vehicles. This policy encourages employers to purchase larger and higher emitting cars - a trend clearly seen in the compositional shift of Australia's fleet in recent years (Climate Council, 2023a). Higher emitting vehicles and electric vehicles should not be receiving the same level and type of tax incentives - this is fundamentally at odds with the decarbonisation goals of the government.

Additionally, the Instant Asset Write-Off scheme currently enables small businesses to write-off the cost of new utes and heavy-duty vehicles if used for business purposes, regardless of the business type (Australian Taxation Office, 2023b). Therefore, businesses such as hairdressers, graphic designers and real estate agents are being equally incentivised to purchase vehicles designed to meet the needs of industries such as trades workers and farmers.

In parallel with designing and implementing a strong fuel efficiency standard, the Australian Government should end these particular tax policies which currently incentivise the purchase of larger, heavier and higher-emitting vehicles. This would ensure that all Commonwealth policy levers are pulling in the same direction: reducing Australia's emissions from personal transport by accelerating the transformation of our light vehicle fleet to low and zero emission vehicles.

### **Recommendation 9**

The Climate Council recommends the decision on whether to adopt a single or twin trajectory design for Australia's fuel efficiency standard be guided by the goal of achieving the maximum possible emissions reduction in the years to 2035.

If a twin trajectory approach is initially adopted, the Climate Council notes it will be essential for all vehicle classes to achieve 0 g CO<sub>2</sub>/km by 2035 at the latest, regardless of the initial slope of the transition trajectory for each.

### **Recommendation 10**

The Climate Council recommends the Australian Government end tax policies which currently incentivise the purchase of larger, heavier and higher-emitting vehicles such as the Fringe Benefits Tax exemption and

the Instant Asset Write-Off approach, in parallel with designing and implementing a strong fuel efficiency standard.

## **Manufacturer flexibility arrangements**

The number and extent of flexibility arrangements that are built into the design of Australia's fuel efficiency standard will determine its success or failure. Aside from the hard deadline of achieving 0g CO<sub>2</sub>/km by 2035 for all vehicle classes, this is the single most important policy design feature to get right. If crediting and other flexibility arrangements are too generous, manufacturers simply will not have a sufficient incentive to change their vehicle fleet mix and supply cheaper, cleaner cars to Australia.

In this section, the Climate Council offers some principles-based observations about the types of crediting and flexibility arrangements that are commonly proposed as part of fuel efficiency standards. We encourage the Department to engage broadly on this issue and ensure that a spectrum of perspectives are taken into account when designing flexibility arrangements for the Australian standard. This is necessary to ensure that the deeply self-interested inputs of vehicle manufacturers are balanced by considerations about the overall effectiveness of the policy and whether it delivers real-world benefits for Australians.

Every time a manufacturer receives a credit within the fuel efficiency standard, the overall effectiveness of the policy is watered down to some extent. This may be appropriate in limited contexts where crediting delivers strong alternative benefits, such as incentivising the supply of genuinely new low and zero emission vehicle technologies. However, a principled approach to policy design requires that the use of crediting and other flexibility mechanisms be minimised overall, and made available only in circumstances where genuine benefit or additionality of emissions reduction can be demonstrated.

### *Banking, transferring and pooling*

Arrangements which allow manufacturers to bank, transfer and pool credits may be appropriate where they are consistent with the above principles. The Climate Council recommends that any banking, transferring and pooling of credits be implemented subject to the requirement that existing credits may only be banked, transferred, pooled or otherwise carried forward within each legislated review period. For example, if the review period is established at three years in line with the Climate Council's recommendation, manufacturers would only be permitted to bank, transfer and pool credits

created between July 2024 and June 2027. All crediting arrangements would then be reset for the next legislated review period.

If credits can be carried forward indefinitely across the life of Australia's fuel efficiency standard, there is the potential for initial policy settings to significantly skew outcomes in later stages. To maximise future flexibility to adjust policy settings as needed, depending on local experience of the standard's implementation, all credits should expire at the end of each legislated review period.

For example, the US has credit carry-forward (saving or banking credits for future use), credit carry-back (also called deficit carry-forward), and credit transfers (across manufacturers). Credit carry-forwards are valid for five years into the future and credit carry-backs can go back three years. US regulators did not adopt indefinite credits, arguing it could lead to some manufacturers accumulating large banks of credits which would undermine the standard and transition to zero and low emissions vehicles (US EPA, 2023b).

### *Super credits*

So-called 'super credits' allow manufacturers to count certain types of vehicles more than once when meeting their fleet average annual emissions ceiling. For example:

- In the EU between 2020-2022 a super credits system applied for passenger cars (not vans) with emissions less than 50g CO<sub>2</sub>/km (counted as two vehicles in 2020, 1.67 vehicles in 2021 and 1.33 vehicles in 2022), capped at 7.5g/km per manufacturer pool. From 2025-2029 a benchmark scheme is adopted and all incentives will be removed by 2030 (European Commission 2021).
- In the US between 2022-2025, vehicle multiplier credits apply for EVs and FCVs (2 vehicles in 2022-2024, 1.75 vehicles in 2025) and PHEVs (1.6 vehicles in 2022-2024, 1.45 vehicles in 2025), with a cumulative cap of 10g/mile. Multiplier incentives will cease at the end of model year 2024 (US EPA 2021).

The use of super credits is heavily favoured by auto manufacturers, as seen in the design of the FCAI's voluntary fuel efficiency standard. Under that industry-designed standard:

- vehicles emitting 0g/km would be counted as three vehicles
- vehicles between 1-33% of the 'value limit curve' for a given year would be counted as two vehicles



- vehicles between 34-66% of the 'value limit curve' for a given year would be counted as 1.5 vehicles (FCAI, 2020)

Super crediting arrangements of this kind are *highly* distortionary to the overall effectiveness and transparency of a fuel efficiency standard. They are also clearly self-serving as they would allow manufacturers to meet their average annual emissions ceilings on paper with relatively minimal real-world changes to the composition of their vehicle fleets. Australians would lose out, as the actual emissions reduction and turnover of Australia's vehicle fleet achieved would be far less than indicated by the headline average annual emissions ceiling.

Further, in considering the use of super credits it must be noted that Australia is designing and implementing its fuel efficiency standard at a much later stage than international counterparts. There may have been some case for applying super credits to low and zero emission vehicles in the past when these other frameworks were established, given the relatively earlier stage of technology development for battery electric, hybrid and other low emissions vehicles. Given the more advanced stage of these technologies today, it is simply not the case that battery electric and hybrid light passenger vehicles need additional incentivisation beyond what is provided directly by the implementation of a fuel efficiency standard. Europe and the US have recognised this, and commenced the phase down of the use of super credits within their fuel efficiency standards. From 2025-2029 the EU is introducing a Zero and Low Emissions Vehicles crediting scheme where manufacturers are required to meet benchmark sales (European Commission 2021) and all incentives will be phased out by 2030.<sup>6</sup> Starting from 2025, the US is ceasing all multiplier credits for BEVs, PHEVs and FCVs (US EPA 2023b). New Zealand's Clean Car Standard, first introduced in 2022, includes minimal use of these crediting arrangements (New Zealand Ministry of Transport, n.d).

Climate Council does not support the provision of super credits within the Australian fuel efficiency standard. If super credits are to be provided anywhere within this scheme, then they should be strictly limited to vehicle types and technologies which are still genuinely at a nascent stage of development. For example, this may include battery electric utes which are suitable for trades work and off-road uses, given the relatively limited availability of these vehicles in Australia today. There is **no case whatsoever** for the provision of super credits to entire classes of vehicle technology (e.g.

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<sup>6</sup> Benchmarks need to be met (15 percent ZLEV from 2025 on and 35 percent ZLEV from 2030 on for cars; 15 percent ZLEV from 2025 on and 30 percent ZLEV from 2030 on for vans) - one percentage point exceedance of the benchmark increases the manufacturer's CO2 target by one percent (this is capped at a maximum five percent) (European Comissions 2021).



battery electric vehicles) or model types where there are suitable alternatives readily available (e.g. heavier passenger SUVs not suited to offroad and work uses).

As noted above, any credits which are provided through the initial policy design should also expire at the first legislated review date. This will provide an opportunity to ensure that all crediting arrangements are serving effective and transparent implementation of the fuel efficiency standard, in light of ongoing technology development.

### *Off-cycle credits*

Additional credits have sometimes been provided in the design of international fuel efficiency standards for so-called 'off cycle' technology benefits. These are designed to reward fuel saving technologies and other vehicle improvements that reduce emissions which are not captured in the formal emissions testing process.

To maintain the integrity of Australia's fuel efficiency standard, manufacturers should ideally not be eligible for off-cycle credits of any kind. However, if off-cycle credits are to be included in some form, their use should be capped at a low, per vehicle level. Further, any technologies supplied as standard in other markets at the time of commencement for Australia's fuel efficiency standard should not be eligible for off-cycle credits. Manufacturers should not receive credits for supplying technologies which are already widely used and available across their international fleets, as these clearly do not need additional incentivisation.

The Department's discussion paper also seeks input on whether manufacturers should be eligible for credits if they use low global warming potential air conditioning refrigerants as opposed to more harmful refrigerants. The Climate Council's position is that the use of high global warming refrigerants should be banned outright in Australia if they are of sufficient concern to warrant policy intervention. Manufacturers should not be able to earn credits by avoiding their use; this will simply mean they are able to *increase* the amount of harmful carbon pollution produced by their vehicles while still appearing to meet their average annual emissions ceiling on paper. The Australian Government should pursue an outright ban on the use of high global warming refrigerants, as a strong regulatory solution is likely to be far more effective in reducing the use of these chemicals than an indirect incentive within the fuel efficiency standard framework.

Comparable markets, including the European Union, USA and New Zealand, are making moves against HFCs as they capitalise on opportunities to make

emission reduction gains in areas where climate-friendly technologies are already available and emerging. The European Union has banned the use of fluorinated greenhouse gases with a greenhouse warming potential (GWP) higher than 150 in all new vehicles entering the market from 1 January 2017 (European Commission 2009).

The U.S Environmental Protection Agency (2022) announced at the end of 2022 a rule to restrict use of super-polluting HFCs where more climate-friendly alternatives are available. This rule is estimated to result in emissions reductions equivalent to the annual fuel consumption of 7.5 million internal combustion vehicles.

In November 2022, New Zealand put forward new measures to reduce the environmental impact of all fluorinated gases (including HFCs) through a phase-out model, including a prohibition on the import and sale of equipment pre-charged with fluorinated-gas refrigerant (New Zealand Ministry for the Environment 2022). This will ensure the use of high-GWP refrigerants does not continue once alternatives are available.

Finally, the Climate Council strongly recommends that whatever combination of crediting arrangements is ultimately adopted in Australia's fuel efficiency standard, the total benefit a vehicle manufacturer can receive through use of credits - super credits, off-cycle credits and any other type - should be capped. This is essential to ensure the policy achieves a guaranteed minimum level of effectiveness, by preventing manufacturers using a diverse combination of credits to avoid their liabilities. We would be happy to provide input to the Department on the design of appropriate cap arrangements as the policy design process continues.

### **Recommendation 11**

The Climate Council recommends that any banking, transferring and pooling of credits be implemented subject to the requirement that existing credits may only be banked, transferred, pooled or otherwise carried forward within each legislated review period.

### **Recommendation 12**

The Climate Council recommends the use of 'super credits' be avoided to the greatest extent possible in designing an Australian fuel efficiency standard. If super credits are to be provided anywhere within the policy design, they should be limited to vehicle types and technologies which are still genuinely at a nascent stage of development.

Super credits should not be made available for entire classes of vehicle technology (e.g. battery electric vehicles) or model types where there are suitable alternatives readily available (e.g. heavier passenger SUVs not suited to offroad and work uses).

### **Recommendation 13**

The Climate Council recommends manufacturers should ideally not be eligible for off-cycle credits of any kind. If off-cycle credits are to be included in some form, their use should be capped at a low, per vehicle level. Any technologies supplied as standard in other markets at the time of commencement for Australia's fuel efficiency standard should not be eligible for off-cycle credits.

### **Recommendation 14**

The Climate Council recommends the use of high global warming refrigerants be banned outright in Australia if they are of sufficient concern to warrant policy intervention. Manufacturers should not be able to earn credits by avoiding their use.

### **Recommendation 15**

The Climate Council recommends the total benefit a vehicle manufacturer can receive through use of credits - super credits, off-cycle credits and any others - should be capped at a low level to ensure integrity of the policy framework.

## **Policy commencement**

As noted throughout this submission, Australia is starting well behind its international counterparts in developing a fuel efficiency standard. For that reason, the Climate Council recommends the Australian Government move swiftly to legislate a national framework and commence implementation shortly after.

The enabling legislation should be introduced to Parliament before the end of 2023, with passage during early 2024. This would allow the policy to commence on 1 July 2024. This is similar to the timeframe provided for legislative passage and implementation of the Government's Safeguard Mechanism reforms - a considerably more complicated policy framework.

If the new fuel efficiency standard arrangements commence on 1 July 2024, the average annual emissions ceiling settings could then be determined on a

financial year basis going forward. This aligns with both the business year for financial and corporate reporting purposes, and other major emissions reporting frameworks - including the Safeguard Mechanism. This approach should be familiar to all major automotive corporations who will be captured by the fuel efficiency standard, and avoid establishing an alternative business compliance cycle which differs from Australia's standard tax and financial reporting requirements.

At present, the primary impediment to the supply of low and zero emissions vehicles to Australia is the lack of a strong regulatory incentive to do so. Vehicle manufacturers are significantly penalised in other markets if they do not supply vehicles below the relevant emissions ceiling applying in each market, which means there is a direct financial benefit to prioritising supply of low and zero emissions vehicles there.

The introduction of a strong fuel efficiency standard in Australia will shift this dynamic and ensure there is the same regulatory incentive - as long as the local settings are comparable with those in other markets. On that basis, it should not be necessary to provide incentives for the supply of low and zero emissions vehicles before the standard commences. Further, recent experience in Australia has shown that there is very strong demand for low and zero emissions vehicles - with new sales releases regularly selling out of available stock in record time (Beazley, 2022). Once the regulatory incentives are harmonised, it appears auto manufacturers are well positioned to profit from significant new vehicle sales and this should provide a sufficient commercial incentive for increasing supply, without further public expenditure.

### **Recommendation 16**

The Climate Council recommends the enabling legislation for a fuel efficiency standard be introduced to Parliament before the end of 2023, with passage during early 2024. This would allow the policy to commence on 1 July 2024.

Following commencement on 1 July 2024, the average annual emissions ceiling settings could then be determined on a financial year basis. This aligns with both the business year for financial and corporate reporting purposes, and other major emissions reporting frameworks.

## Penalties

The setting of penalties is an important regulatory lever. If these are set too low there is a risk that manufacturers simply add the penalty to the purchase price of higher emitting vehicles and continue selling these vehicles in Australia. This would be a poor outcome both for Australian consumers *and* carbon pollution.

Penalties therefore need to be set at a sufficient level to drive genuine compliance. The Climate Council notes that there is significant variation in the penalties set in other comparison markets such as the US, New Zealand and EU, and that uptake of low and zero emissions vehicles is most advanced in markets with the strongest penalties. While there are likely multiple factors at play in determining vehicle supply, it is consistent with regulatory practice across government that stronger penalties will better incentivise compliance and therefore support increased supply of lower and zero emission vehicles.

The Climate Council also encourages the Department to consider implementing 'anti-avoidance' rules and associated penalties as part of the design of an Australian fuel efficiency standard. Manufacturers should not be able to avoid their obligations either by technological means - as seen in the Volkswagen emissions testing issue, or by re-classifying vehicles between classes to take advantage of different policy settings - such as any 'twin trajectory' design adopted. A non-exhaustive list of anti-avoidance provisions for further consideration could include:

- preventing manufacturers from changing the categorisation of vehicles - e.g. moving from the MA to MC category - except at specific, regulated intervals such as each legislated review period;
- introducing strong corporate penalties for actions which have the effect of obscuring or misrepresenting the actual emissions performance of a manufacturers' fleet and/or individual vehicle types within this;
- making nominated company representatives liable for the accuracy of the fleetwide emissions data provided to the regulator.

The inclusion of anti-avoidance provisions will both ensure the fuel efficiency standard is effective and transparent, in line with the government's guiding principles, and enforce a level playing field between participants by ensuring everyone is playing by the rules.

### **Recommendation 17**

The Climate Council recommends penalties be set at a sufficient level to drive genuine compliance. It is consistent with regulatory practice across government that stronger penalties will better incentivise compliance and therefore support increased supply of lower and zero emission vehicles.

### **Recommendation 18**

The Climate Council encourages the Department to also consider implementing 'anti-avoidance' rules and associated penalties as part of the design of an Australian fuel efficiency standard, to further incentivise genuine compliance and a level playing field for all participants.

## **Information disclosure**

The information disclosure requirements underpinning an Australian fuel efficiency standard should be designed with effective implementation of the policy and achievement of positive outcomes for the community in mind.

Vehicle manufacturers would be expected to favour minimal information disclosure because this reduces compliance requirements and maintains a degree of opacity both from regulators and the community. However, there are instances where effective implementation of the framework over time will require significant information disclosure by manufacturers and this should be clearly built in as a requirement from its commencement.

For example, to determine whether any given settings within the policy are too 'hard' or too 'soft' in light of current vehicle technology and market trends, it will be necessary for regulators to have visibility both of manufacturer sales activity in Australia and that in other markets. This is because, for example, arguments about the availability of certain technologies or vehicle types should take into account the global nature of manufacturing and vehicle supply - not just what manufacturers choose to supply in Australia for commercial reasons. Regulators should therefore be able to request information about broader supply chains and manufacturing capacity from manufacturers as needed to determine appropriate policy settings in Australia, with manufacturers having an obligation to provide this.

Separately, the transparency and effectiveness of Australia's fuel efficiency standard depends on regulators and the community being able to determine whether the average annual emissions ceiling in any given year is genuinely

being met. As discussed in the section above on **Manufacturer flexibility arrangements** (p.30-34), the use of various credits has the potential to significantly undermine the genuine achievement of the ceiling *and* visibility over whether it has been met. For this reason, manufacturers should be required to report in detail on their use of credits in each compliance period. This reporting should be in a standard format determined by regulators for direct comparability, and cover the use of any credits provided for within the framework, broken down by volume and category (for example, super credits, off-cycle credits, and any other category of credits). Regulators may then use this reporting to determine how effectively the policy is operating under any given set of policy settings, and release aggregated summary information to inform community discussion.

Finally, at the moment there is no free, transparent and granular data available in Australia on vehicle sales by type and manufacturer. The only high-quality data is from the Federal Chamber of Automotive Industries' VFACTS database. This is provided under a very expensive fee-for-service model, and the data are not presented in ways which enable transparent analysis and reporting of vehicle sales trends. As part of establishing a fuel efficiency standard, the scheme regulator should be tasked with aggregating and making available free, public, frequent, granular and reliable data about vehicle sales on an annual basis. It is unacceptable that at the moment Australians cannot understand what is happening in the vehicle market, without needing to pay vehicle manufacturers for opaque and confusing data.

### **Recommendation 19**

The Climate Council recommends the information disclosure requirements underpinning an Australian fuel efficiency standard be designed with effective implementation of the framework and achievement of positive outcomes for the community in mind - not minimising regulatory requirements for manufacturers.

### **Recommendation 20**

The Climate Council recommends manufacturers be required to report in detail on their use of credits in each compliance period. This reporting should be made in a standard format determined by regulators, and cover the use of any credits available, broken down by volume and category.

### **Recommendation 21**

The Climate Council recommends the regulator for an Australian fuel efficiency standard be tasked with aggregating and making available free,

public, frequent, granular and reliable data about vehicle sales on an annual basis.



## Conclusion

With the transformation of Australia's energy system underway and accelerating rapidly, decarbonising transport is the next frontier in tackling harmful climate change. Designing and implementing a strong fuel efficiency standard for Australia's light vehicle fleet is an essential step to drive down carbon pollution, while also cutting the cost of living for Australians, delivering cleaner air for better health, boosting national energy security, and improving vehicle safety. Australians have much to gain from this reform - no matter what type of new car they choose to buy. That's why it is essential the Australian Government now moves quickly to put a strong fuel efficiency standard in place.

Without a strong fuel efficiency standard, it is unlikely that any other combination of government actions and incentives will achieve the desired outcomes of making low and zero emissions vehicles more affordable and accessible to promote uptake and cut emissions from personal transport. However, this reform is also unlikely to drive the full transformation of Australia's new vehicle fleet on its own.

The continued incentivisation of certain types of petrol and diesel vehicles through fringe benefits tax, the instant asset write-off rules, and other tax incentives, are now directly at odds with the objective of promoting increased uptake of low and zero emissions vehicles. These benefits and subsidies should be phased out on that basis.

Decarbonising transport is a significantly larger task than transitioning the current light vehicle fleet to low and zero emission vehicles. Mode shift to other forms of transport entirely for day-to-day journeys will play a significant role in reducing emissions while also delivering a wide range of other benefits - particularly in our cities. The active pursuit of mode shift should therefore be a key consideration for transport policy at all levels of government. Equally, fully decarbonising the transport sector will require new solutions across a range of sub-sectors, including medium and heavy vehicles. A coordinated and holistic focus on these broader challenges through the development of a Zero Emission Transport Strategy should be prioritised alongside work on an Australian fuel efficiency standard and the delivery of the National Electric Vehicle Strategy.

The Climate Council stands ready to contribute to further detailed design conversations with the Department about the development of an Australian fuel efficiency standard. We encourage you to approach this process with the

urgency and ambition needed now to protect Australians from further harmful climate change by rapidly cutting major sources of emissions.

## References

Adiona Tech (2023). Australian transport electrification priorities. Accessed: <https://www.adionatech.com/resources/connected-thinking-report>

Australian Petroleum Statistics (2022). Full Year Statistics, 2022. Accessed: <https://www.energy.gov.au/government-priorities/energy-data/australian-petroleum-statistics>

Australian Taxation Office (2023a). Exempt use of eligible vehicles. Accessed: <https://www.ato.gov.au/Business/Fringe-benefits-tax/Types-of-fringe-benefits/fbt-on-cars,-other-vehicles,-parking-and-tolls/exempt-use-of-eligible-vehicles/>

Australian Taxation Office (2023b). Instant asset write-off for eligible businesses. Accessed: <https://www.ato.gov.au/Business/Depreciation-and-capital-expenses-and-allowances/Simpler-depreciation-for-small-business/Instant-asset-write-off/>

Beazley, J (2022). Sold out: why Australia doesn't have enough electric vehicles to go around, *The Guardian* 27 March 2022. Accessed: <https://www.theguardian.com/environment/2022/mar/27/sold-out-why-australia-doesnt-have-enough-electric-vehicles-to-go-around>

Bloomberg, 2023, Carmakers Can Kiss Pre-Pandemic Combustion Car Sales Goodbye, 9 March 2023. Accessed at: <https://www.bloomberg.com/news/articles/2023-03-09/carmakers-can-kiss-pre-pandemic-combustion-car-sales-goodbye?leadSource=uverify%20wall#xj4y7vzkg>

Climate Council (2022a). Race to zero emissions: who's the cleanest of them all? Accessed: <https://www.climatecouncil.org.au/resources/race-to-zero-emissions-whos-the-cleanest-of-them-all/>

Climate Council (2022b). Submission to the National Electric Vehicle Strategy Consultation. Accessed: <https://www.climatecouncil.org.au/wp-content/uploads/2022/11/CCA-NEV-Submission.pdf>

Climate Council (2023a). Ute beauty! The case for lower and zero emissions utes. Accessed:

<https://www.climatecouncil.org.au/resources/ute-beauty-case-for-lower-and-zero-emissions-utes-australia/>

Climate Council (2023b). Shifting gear: the path to cleaner personal transport. Accessed:

<https://www.climatecouncil.org.au/resources/shifting-gear-the-path-to-cleaner-transport/>

Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2022a). Quarterly update of Australia's national greenhouse gas inventory: June 2022. Accessed:

<https://www.dcceew.gov.au/climate-change/publications/national-greenhouse-gas-inventory-quarterly-update-june-2022>

Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2022b). Australia's emissions projections 2022. Accessed:

<https://www.dcceew.gov.au/sites/default/files/documents/australias-emissions-projections-2022.pdf>

Electric Vehicle Council (2022). State of Electric Vehicles. Accessed: Available at: <https://electricvehiclecouncil.com.au/state-of-evs-october2022/>

Environment Protection Agency (2022). Health Effects of Ozone Pollution. Accessed:

<https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution>

European Commission (2009). Mobile air conditioning systems. Accessed at: [https://single-market-economy.ec.europa.eu/sectors/automotive-industry/environmental-protection/mobile-air-conditioning-systems-macs\\_en](https://single-market-economy.ec.europa.eu/sectors/automotive-industry/environmental-protection/mobile-air-conditioning-systems-macs_en)

European Commission (2021) CO<sub>2</sub> emission performance standards for cars and vans. Accessed at:

[https://climate.ec.europa.eu/eu-action/transport-emissions/road-transport-reducing-co2-emissions-vehicles/co2-emission-performance-standards-cars-and-vans\\_en](https://climate.ec.europa.eu/eu-action/transport-emissions/road-transport-reducing-co2-emissions-vehicles/co2-emission-performance-standards-cars-and-vans_en)

European Public Health Alliance (2021). Electric vehicles and air pollution: the claims and facts. Accessed:

<https://epha.org/electric-vehicles-and-air-pollution-the-claims-and-the-facts/>

Federal Chamber of Automotive Industries (FCAI) (2023). FCAI releases 2022 brand CO2 emissions data. Accessed:

<https://www.fcai.com.au/news/index/view/news/795>

Federal Chamber of Automotive Industries (FCAI) (2022). VFACTS National Data 13 Months from October 2021 to October 2022.

Federal Chamber of Automotive Industries (FCAI) (2020). CO2 Standard: Rules for Calculating Brand Targets and Assessing Brand Compliance. Available:

[https://www.fcai.com.au/library/publication/fcai\\_rules\\_for\\_calculating\\_co2\\_compliance.pdf](https://www.fcai.com.au/library/publication/fcai_rules_for_calculating_co2_compliance.pdf)

Federal Chamber of Automotive Industries (2013). FCAI Annual Report 2012. Accessed:

<https://www.fcai.com.au/annualreports/index/view/publication/48>

Grattan Institute (2021a). The Grattan Car Plan: Practical policies for clean transport and better cities. Accessed:

<https://grattan.edu.au/wp-content/uploads/2021/10/Grattan-Car-Plan.pdf>

Grattan Institute (2021b). Towards net zero: practical policies to reduce transport emissions. Accessed:

<https://grattan.edu.au/report/towards-net-zero-practical-policies-to-reduce-transport-emissions/>

Green Vehicle Guide (2023). Search cars. Accessed:

<https://www.greenvehicleguide.gov.au/Vehicle/Search>

International Council on Clean Transportation (ICCT) (2023a) Data Tables February 2023. Accessed at: <https://theicct.org/pv-fuel-economy/>

ICCT (2023b) Light-duty Vehicle Classification for Australia's Fuel Efficiency Standards. Accessed at:

<https://theicct.org/publication/pv-australia-vehicle-classification-apr23/>

ICCT (2022) CO2 emissions from new passenger cars in Europe: Car manufacturers' performance in 2021. Accessed at:

<https://theicct.org/wp-content/uploads/2022/08/co2-new-passenger-cars-europe-aug22.pdf>

International Energy Agency (2022). Net Zero by 2050 Roadmap. Accessed:

<https://www.iea.org/reports/by-2030-evs-represent-more-than-60-of-vehicles-sold-globally-and-require-an-adequate-surge-in-chargers-installed-in-buildings>

Melbourne Climate Futures (2023). Health impacts associated with traffic emissions in Australia. Accessed:  
<https://www.unimelb.edu.au/newsroom/news/2023/february/vehicle-emissions-may-cause-over-11,000-deaths-a-year-research-shows>

National Transport Commission (2022). Carbon Dioxide Emissions Intensity for New Australian Light Vehicles 2021. Accessed:  
<https://www.ntc.gov.au/sites/default/files/assets/files/Carbon%20Dioxide%20Emissions%20Intensity%20for%20New%20Australian%20Light%20Vehicles%202021.pdf>

New Zealand Ministry of Transport (n.d). Clean Cars: Reducing light vehicle emissions by introducing a CO2 emissions standard for imported new and used light vehicles. Accessed:  
<https://www.transport.govt.nz/area-of-interest/environment-and-climate-change/clean-cars/>

New Zealand Ministry for the Environment (2022). Proposed measures to reduce the environmental impact of fluorinated gases. Accessed at:  
<https://environment.govt.nz/assets/publications/Proposed-measures-to-reduce-the-environmental-impact-of-Fgases-summary.pdf>

Smit, R. et al (2019). Australians could have saved over \$1 billion in fuel if car emissions standards were introduced three years ago, *The Conversation*. Accessed:  
<https://theconversation.com/australians-could-have-saved-over-1-billion-in-fuel-if-car-emissions-standards-were-introduced-3-years-ago-117190>

Solar Citizens (2023). Recharging Australia. Accessed:  
[https://www.solarcitizens.org.au/roadshow\\_reports\\_australia](https://www.solarcitizens.org.au/roadshow_reports_australia)

The Australia Institute (2022). Australia 91% reliant on foreign oil: Research Report. Accessed:  
<https://australiainstitute.org.au/post/australia-91-reliant-on-foreign-oil-research-report/>

Toscano, N (2022). Geelong oil refinery lifts fuel reserves amid energy security concerns, *Sydney Morning Herald*, 17 April 2023. Accessed:  
<https://www.smh.com.au/business/companies/geelong-oil-refinery-lifts-fuel-reserves-amid-energy-security-concerns-20230414-p5d0h8.html>

United States Environmental Protection Agency (US EPA) (2023a) Multi-Pollutant Emissions Standards for Model Years 2027 and Later

Light-Duty and Medium-Duty Vehicles. Accessed at:

<https://www.epa.gov/system/files/documents/2023-04/420f23009.pdf>

US EPA (2023) Federal Register: Multi-Pollutant Emissions Standards for Model Years 2027 and Later LightDuty and Medium-Duty Vehicles.

Accessed at:

<https://www.govinfo.gov/content/pkg/FR-2023-05-05/pdf/2023-07974.pdf>

US EPA (2022) Automotive trends report. Accessed at:

<https://www.epa.gov/automotive-trends/explore-automotive-trends-data#SummaryData>

US Environment Protection Agency (2022) EPA Proposes Rule to Advance Transition to Safer, More Efficient Heating and Cooling Technologies.

Accessed at:

<https://www.epa.gov/newsreleases/epa-proposes-rule-advance-transition-safer-more-efficient-heating-and-cooling>

US EPA (2021) Federal Register: Revised 2023 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions Standards. Accessed at:

<https://www.govinfo.gov/content/pkg/FR-2021-12-30/pdf/2021-27854.pdf>

World Economic Forum (2023). 1 in 7 cars sold globally now is electric.

Accessed at:

<https://www.weforum.org/agenda/2023/03/ev-car-sales-energy-environment-gas/#:~:text=There%20were%2010.6%20million%20electric,support%20them%20in%20the%20market.>