

RECHARGING AUSTRALIA

HOW TO SAVE AUSTRALIA \$11 BILLION IN FUEL COSTS AND ELECTRIFY OUR FLEET

A Report on the Benefits of a Strong Fuel Efficiency Standard



WELL ELECTRIC



SolarCitizens



KEY INSIGHTS

- A strong Fuel Efficiency Standard is a key policy needed to reduce transport emissions and unlock a supply of affordable electric vehicles (EVs) to help tackle the cost of living crisis for all Australians.
- Introducing a Fuel Efficiency Standard for light vehicles of 95 grams CO₂/km would save Australian motorists \$11.2 billion in fuel costs over five years.
- The cost-saving benefits of a strong Fuel Efficiency Standard will be greater for regional drivers, relative to city drivers, because they typically spend a higher percent of weekly earnings on transport costs due to longer average commutes, higher regional fuel prices and higher rates of car ownership.
- A Fuel Efficiency Standard will turbocharge the growth of EVs and could see Australian EV registrations grow from 14,255 in 2020 to more than 913,359 in five years.
- The reduction in transport emissions from a strong Fuel Efficiency Standard will improve air quality and health outcomes for Australia.
- Failing to introduce a strong Standard will lock Australia into spiralling fuel costs, limit vehicle choice for consumers, and see harmful transport emissions continue to rise.

CONTENTS

2	Key Insights
4	Unpacking Fuel Efficiency Standards
5	A Fuel Efficiency Standard for Australia
6	What is a Fuel Efficiency Standard?
7	Benefits for Australia: Fuel Costs
7	A Fuel Efficiency Standard will save Australian motorists \$11.2 billion in fuel costs
9	Benefits for Australia: More EVs in the Regions
9	A Fuel Efficiency Standard will electrify Australia's vehicle fleet
10	Benefits for Australia: Health
11	The Fuel Efficiency Standard Australia Needs
11	Ambition
12	Standards around the world
13	Plan B: New Zealand
13	Plan C: United States
15	Integrity
16	Equity
17	Research Assumptions
18	Appendix
19	Endnotes
20	Data Sources

UNPACKING FUEL EFFICIENCY STANDARDS

After almost a decade of inaction and roadblocks to affordable clean transport, the time has come for Australia to introduce a Fuel Efficiency Standard to accelerate the shift to electric vehicles.

As this report details, a strong Standard will reduce the cost of living and save Australian drivers billions in annual fuel costs, improve local health outcomes, and cut our transport emissions.



A Fuel Efficiency Standard for Australia

Solar Citizens has analysed the impact that a Fuel Efficiency Standard will have for Australia and the benefits of these Standards for local motorists and residents.

This research draws on Australian Bureau of Statistics (ABS) and Census 2021 data to calculate the likely fuel cost savings and growth in electric vehicle (EV) sales in Australia. Additional benefits such as improved health outcomes due to reduced transport pollution were also identified.

The findings demonstrate that the introduction of a Fuel Efficiency Standard for Australia, equivalent to what is already in place in Europe, will slash fuel costs by between \$11.2 billion to \$14.3 billion for Australian motorists over five years. Introducing this key policy will unlock a reliable supply of affordable EVs and help to address the rising cost of living crisis, especially in regional areas.

Currently, Australia and Russia are the only two countries in the Organisation for Economic Co-operation and Development (OECD) that lack a Fuel Efficiency Standard. This is holding back the decarbonisation of the Australian motor vehicle fleet, making Australia a dumping ground for inefficient and polluting car models, and depriving Australian drivers of choice in EV models, with only 38 models available for sale in 2022.¹

Introducing a Standard for Australia will induce global car makers to increase the supply of electric and low-emissions vehicles to the Australian market, giving drivers more consumer choice, slashing domestic fuel usage, and increasing national security – as we will no longer be wholly reliant on imported petroleum, but can instead integrate charging into our energy grid and capitalise on Australia's enthusiastic uptake of domestic solar.

Regional Australia has the most to gain from a Fuel Efficiency Standard

Regional Australia is set to reap the largest benefits of a Fuel Efficiency Standard due to a number of factors. Residents living in regional locations typically drive longer distances, pay higher fuel prices, and own more vehicles and larger vehicles than the national average, while also earning less than metropolitan areas.

A Standard will save regional Australians billions in fuel costs and result in more local money being invested back into the local economy, rather than funding international petroleum companies.

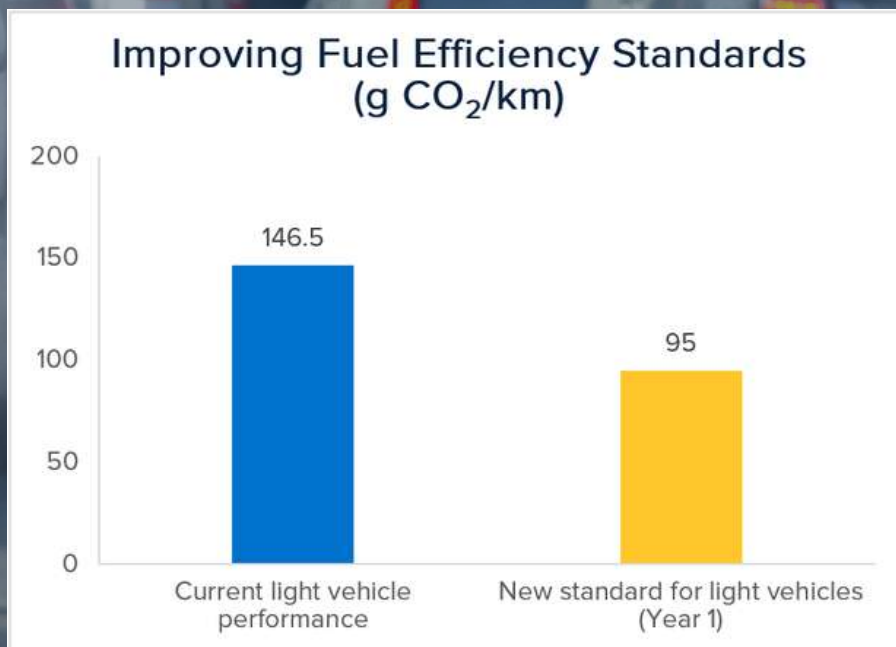


Figure 1: Fuel Efficiency Standard Improvements
(Source: National Transport Commission)

WHAT IS A FUEL EFFICIENCY STANDARD?

A Fuel Efficiency Standard sets an average carbon emissions target for new vehicles sold by each car maker every year. Globally, more than 80 per cent of vehicles sales already occur in a market covered by a Fuel Efficiency Standard.²

Australia, however, doesn't have a mandatory standard and this has resulted in an inefficient and expensive-to-run national internal combustion engine (ICE) car fleet. Emissions from new Australian passenger cars and light SUVs in 2021 averaged 146.5 grams of carbon dioxide per kilometre (g CO₂/km) (Figure 1) – in stark contrast to global leader Norway, where new vehicle emissions achieved an average of 28 g CO₂/km.³

Introducing a Standard will oblige car makers to sell cars and utes that on average meet a limit for CO₂ emissions (calculated as an average for all their cars sold), with penalties applied if they don't meet this standard. The Standard is tightened over time, which means that the mix of vehicles a car maker provides Australia will include more EVs as time goes on, until 100% of new vehicles sold are zero emissions.

The lack of a Standard is restricting the supply of EVs to Australia – as manufacturers prioritise markets where Standards are already in place.

Adopting a Fuel Efficiency Standard of 95g CO₂/km, the same that has been in place in the European Union since 2020, will increase the supply of EVs to Australia—including a greater diversity of models—and reduce fuel use, air pollution and the cost of living for everyday Australians.

BENEFITS FOR AUSTRALIA: FUEL COSTS

A Fuel Efficiency Standard will save Australian motorists \$11.2 billion in fuel costs

Solar Citizens' analysis has shown that by introducing a Fuel Efficiency Standard equivalent to current EU policy – our **Central** scenario (the Solar Citizens Standard) – would save motorists in Australia \$11.2 billion in fuel costs over five years. Even higher savings of \$14.3 billion could be realised by following the more ambitious **Supercharge** scenario (Figure 2, Table 2).

This research used three scenarios, **Flat**, **Central** and **Supercharge**, to analyse the impacts. In the Flat scenario, a flat 95 g CO₂/km Fuel Efficiency Standard (or 35% efficiency improvement) across 10 years was modelled as a baseline, the Central scenario models 95 g CO₂/km and reduces to 0 g CO₂/km over 10 years, while the Supercharge scenario reaches 0 g CO₂/km in five years (Table 1).⁴

Over time, these small changes in efficiency driven by a stronger Fuel Efficiency Standard lead to big fuel cost savings for motorists.

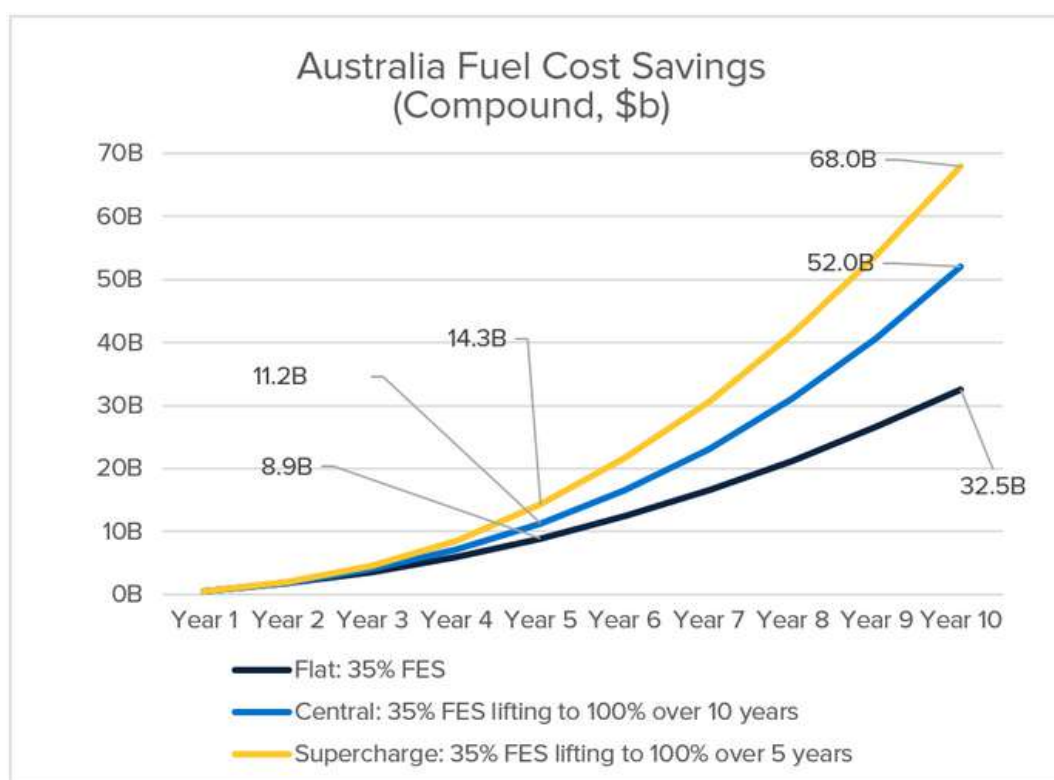


Figure 2: Australia Fuel Cost Savings
(Source: Springmount Advisory modelling based on ABS Census Data)

BENEFITS FOR AUSTRALIA: FUEL COSTS

On average, 5% of vehicles in Australia's fleet are replaced each year. This means that each year roughly 733,962 new cars join the fleet of 14.7 million passenger vehicles.⁵

Once a Fuel Efficiency Standard is introduced, those new cars will be substantially more efficient than the rest of the fleet and require less fuel to run, reducing the overall fuel use for Australia. The benefits compound over time as more new cars are added to the fleet and displace older, less efficient models.

As the average lifespan of a car in Australia is 20 years*, rapidly introducing a Standard will prevent Australia being stuck with a fleet of highly polluting vehicles for decades longer.

* Roughly 1.1 million vehicles are sold in Australia per year, with a total fleet size of 18 million vehicles in total⁶. This increases by around 0.2 million vehicles per year, which means around 0.9 million are being retired each year. 18 million vehicles / 0.9 million retired per year = 20 year turnover.



BENEFITS FOR THE REGIONS: MORE ELECTRIC VEHICLES

A Fuel Efficiency Standard will electrify the regional vehicle fleet

The introduction of a Fuel Efficiency Standard will drive a rapid increase in the uptake of EVs across Australia.

In order to achieve a target of 95 g CO₂/km, car makers will need to substantially increase the sale of electric vehicles.

We have made a conservative assumption that 50% of the Fuel Efficiency Standard target will be achieved by selling EVs in the first five years, with the remainder from efficiency improvements to ICE vehicles. In our Central scenario, this would see the regional EV fleet on the road from 40,000 in 2022 to nearly 900,000 in the first five years of a Standard.

This is a conservative estimate, as EVs will likely be responsible for achieving an even greater share of the target. Efficiency improvements to combustion engines are incremental and unlikely to deliver the step change improvements that a Fuel Efficiency Standard requires.

Introducing a strong Fuel Efficiency Standard is critical to both achieve Australia's national commitment to reduce emissions by 43% by 2030.



BENEFITS FOR AUSTRALIA: HEALTH

New evidence suggests that motor vehicle pollution may be far more damaging to our health than previously thought. A study by University of Melbourne researchers highlights the twin dangers of motor vehicle pollution – fine particles (PM_{2.5}) and exhaust gas (NO₂)⁷. Motor vehicles produce NO₂ by burning fossil fuels, and fine particulate matter through both the burning of fossil fuels and through tire, road and brake pad wear – with the tiny size and chemical composition of exhaust particles being particularly toxic.

While prior estimates and government policies have taken PM_{2.5} into account, these models have not sufficiently accounted for NO₂, and so the true number of deaths attributable to motor vehicle pollution has been underestimated for years.

Using the latest figures, the researchers estimate that motor vehicle pollution causes more than 11,000 premature deaths of Australian adults every year – ten times the number killed in motor vehicle crashes. They also estimate that they cause 12,000 cardiovascular hospitalisations and 7,000 respiratory hospitalisations per year, as well as increasing the prevalence of asthma in children by 66,000.

Children and unborn babies are the most vulnerable to motor vehicle pollution, with impacts on their organs and development that can affect them for the rest of their lives.

While motor vehicles are not the only source of pollution affecting health, it is worth noting that regional Australians have a prevalence of asthma 10% higher than the national average, and lung disease 34% higher, so stand to benefit most from cleaner air.

As the researchers note, “There is no threshold below which impacts do not occur, therefore small improvements even at low concentrations will yield significant health gains.” The reduction in air pollution that a sensible Fuel Efficiency Standard could bring will have a clear impact on the health of Australians - allowing us all to breathe a little easier

THE FUEL EFFICIENCY STANDARD AUSTRALIA NEEDS

The longer Australia has to wait for a Fuel Efficiency Standard, the more time that Australians from all walks of life will be chained to higher fuel costs.

A Fuel Efficiency Standard should prioritise three components: Ambition, Integrity and Equity.

Ambition



The Federal Government should design an ambitious standard that maximises regional benefits by commencing a Standard in the next year – no later than the 1st of January, 2024. This will ensure car makers have sufficient time to get ready, but also send a clear message of what is expected of them in the near future.

As Australia is starting from further behind our trading partners who already have Fuel Efficiency Standards, we will need to reduce average vehicle emissions at a faster rate and we cannot afford a weak or delayed start.

Solar Citizens recommends that the starting limit of our Standard be 95 grams of CO₂ per kilometre – competitive with the European Union. Alternatively, a Standard in line with New Zealand's trajectory could be considered. This ensures we don't remain at the back of the international queue for new EVs and low-emissions vehicles and can catch up to other major markets by 2030.

The Standard should tighten over time and reach 0 grams CO₂/km (the point at which 100% of new car sales are zero emissions) as soon as possible, but no later than 2035 to meet our commitments under the Paris Climate Accord and limit global warming to 1.5°C.

Given the significantly higher emissions of Light Commercial Vehicles and the availability of electric and low-emissions models on the market right now, this segment could have a higher initial starting limit and different trajectory to passenger vehicles but still aim to achieve and reach 0 grams CO₂/km at the same time.



Standards around the world

As one of only two G20 countries yet to implement a Fuel Efficiency Standard, Australia is currently at a crossroads. However, this puts us in the unique position of being able to learn from the successes and missteps of other countries.

Plan A: Solar Citizens Standard

The Solar Citizens Standard (our Centeal Scenario) is based on analysis which has modelled a linear trajectory, starting at 95 grams of CO₂ per kilometre (the level of the European Union's 2022 Standard), or a 35% efficiency improvement on the national emissions average for light vehicles.

This proposed Standard would reach 0g/km (or a 100% efficiency improvement) after ten years, in line with the International Energy Agency's recommendation to cease selling petrol and diesel vehicles by 2035⁸. Following this trajectory, Australians are set to save at least \$11 billion over five years and \$52 billion over ten years in fuel costs.

Starting Australia's Fuel Efficiency Standard at the same level as the European Union ensures that we have the best savings in fuel costs available for Australians as soon as possible, to ease the burden on the spiralling cost of living.

However, the trajectory and starting limit of the Standard is yet to be decided. There are currently proposals for Standards to be aligned with other trading partners, such as New Zealand and the United States. Each of these proposed Standards would save Australians less in petrol costs than our modelled Standard, especially in the early years as efficiency improvements are significantly weaker.

Plan B: New Zealand

Across the ditch, New Zealand’s Clean Car Standard came into effect in December 2022 and, combined with the existing Clean Car Discount subsidy scheme, has already exceeded expectations of reducing the emissions intensity of the country’s fleet. Table 3 shows the trajectory of the first five years of New Zealand’s Standard and the expected efficiency improvements in the country’s vehicle fleet. The scheme is simple yet effective, strong enough to catch up to the European Union before 2030 while adhering to our "Integrity" principle as it does not have loopholes or concessions.

Year	2021 (measured emissions)	2022	2023 (standard begins)	2024	2025	2026	2027
Grams of CO2 per kilometre	169	-	145	133.9	112.6	84.5	63.3
Efficiency improvement of New Zealand Fleet	0%		14.2%	20.8%	33.4%	50%	62.5%

Table 3: New Zealand’s annual CO₂ targets for its Clean Car Standard for light vehicles. Compared to the European Union Standard, the Clean Car Standard starts off more gradually, accelerates after one year, and then becomes more gradual again after year five.

Solar Citizens’ analysis shows that if the Clean Car Standard was applied to Australia, we would expect to see \$7.3 billion in fuel cost savings over five years, \$3.9 billion less than if we adopt the European Union’s starting limit. The number of EVs in the national fleet would also reduce by 21.7%, to 715,372 EVs over five years.

Plan C: United States

Although the United States standard starts at a limit of lower grams of CO₂ per kilometre, by year two, New Zealand’s Clean Car Standard achieves a lower limit and remains more stringent for the remainder of the years. For this reason, if the United States Standard was applied to Australia, we would expect to see \$7.1 billion in fuel cost savings over five years, \$4.1 billion less than if we adopt the European Union’s starting limit. The number of EVs in the national fleet would also reduce by 30%, to 648,554 EVs over five years.

The difference in fuel cost savings between the United States’ Standard and New Zealand’s Clean Car Standard may seem nominal, however, the savings over ten years become more pronounced (Table 4). At the ten year mark, although the New Zealand Standard is \$8.4 billion less in savings than the Solar Citizens Standard (our Central scenario), it delivers nearly \$3 billion more than the United States Standard.

	Year 1	Year 5	Year 10
Solar Citizens	\$ 590 million	\$ 11.22 billion	\$ 52.02 billion
New Zealand	\$ 145 million	\$ 7.33 billion	\$ 43.65 billion
United States	\$ 305 million	\$ 7.16 billion	\$ 40.81 billion

Table 4: Cumulative Fuel Cost Savings over one, five and ten years with three different Fuel Efficiency Standards: Solar Citizens, New Zealand, and United States.

Auto industry groups are currently flagging the US Standard as their preferred option, with the use of “super credits” – but this is not going to yield the best results for all Australians and yield less real-world gains. In deciding on a Fuel Efficiency Standard, the Federal Government should prioritise the best economic and emissions outcomes for everyday Australians, who would most benefit from the greater reductions in petrol costs and climate and health impacts of the stricter European Union starting limit (the Solar Citizens Standard).

It should be noted that whichever Standard the Federal Government decides to align with, it must reach 0 grams of CO₂ per kilometre after ten years if we are to meet Net Zero emissions by 2050 (Figure 3). Starting at a slower pace, or allowing using super credits which can be used as loopholes and slow progress, only means that the Standard will be tougher to meet in later years.

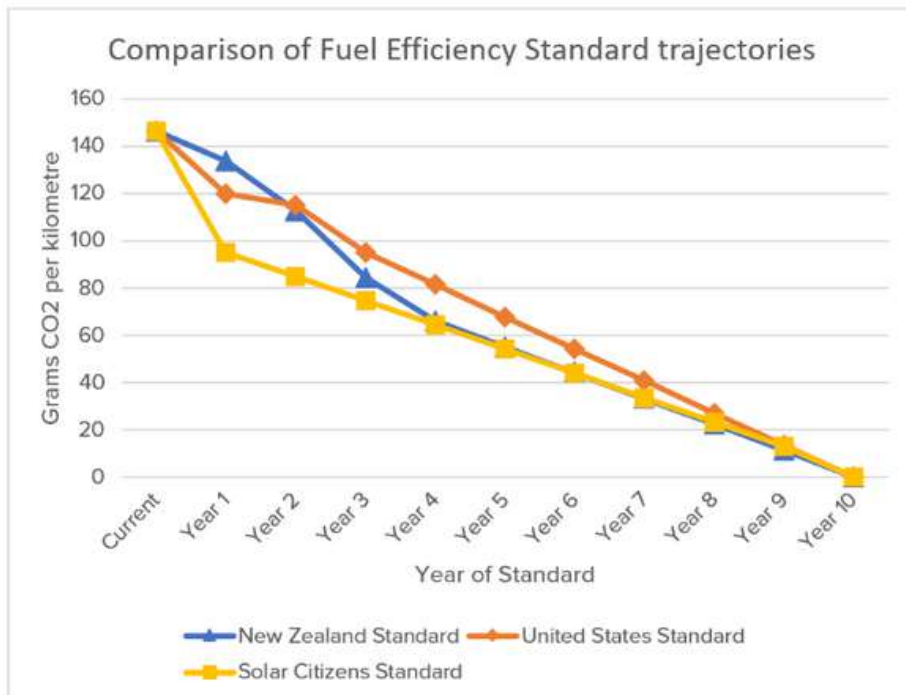


Figure 3: A comparison of the trajectory of each of the EU, NZ and US Standards applied to Australia

THE FUEL EFFICIENCY STANDARD AUSTRALIA NEEDS

Integrity



This Standard should apply to all car makers that wish to sell vehicles to the Australian market. Importantly, it should be noted that this Standard is not directed at consumers, and a government body such as the Australian Competition and Consumer Commission should ensure that any penalties incurred by manufacturers are not ‘passed on’ to consumers.

A government agency such as the Climate Change Authority should be tasked with enforcing the Standard to ensure high consumer trust, with regular reviews at least every two years. The Standard should also use the World Light Vehicle Harmonised Testing Procedure (WLTP) as a measurement system, bringing us up to date with the rest of the world.

Currently, the Federal Government doesn't know the emissions intensity of the national vehicle fleet, because the Federal Chamber for Automotive Industries (FCAI) does not provide the data. For a Fuel Efficiency Standard to have any integrity, this data must be collected and published on a regular basis, by a government agency such as the National Transport Commission and not by the industry.

Manufacturer penalties should be significant enough to outweigh any commercial benefits of exceeding the limit. We believe that it's fair for Australians to expect car makers to do their bit for the climate and pay their fair share if they aren't able to meet the Standard needed to bring emissions under control.

Additionally, no loopholes like so-called “super credits” or “eco-innovation credits” should be considered that can result in disingenuous participation from car makers and a lower actual reduction in emissions. Strong emissions limits such as our proposed 95 g CO₂/km mean that we should not need super credits, which are designed to encourage car makers to supply more zero-emissions vehicles to the market.

Globally, the EV industry is no longer in its infancy so there is not the need to encourage investment in this way.

Strong emissions limits alone are enough to incentivise manufacturers to provide EVs to the market.

THE FUEL EFFICIENCY STANDARD AUSTRALIA NEEDS

Equity



When the Standard comes into effect, it should send a strong market signal to car makers that they must prioritise a variety of low and zero emissions vehicles that suit all Australian motorists – including vehicles suitable to regional Australians and for trades, such as utes.

Finally, a Standard should be accompanied by measures to reduce upfront cost of EVs such as the Federal Government’s Electric Car Discount bill and increase charging accessibility for all.



RESEARCH ASSUMPTIONS

Our research uses ABS statistics to define the area and geospatial statistics for Australia.

Fuel costs savings make the following assumptions:

- that 5% of fleet is turned over per annum and is evenly distributed
- that light passenger vehicle are 146.5g CO₂/km
- that a new Fuel Efficiency Standard will start in Year 1 at 95g CO₂/km
- that 95g CO₂/km represents a fuel efficiency improvement of 35% in Year 1
- that fuel prices, fleet size and annual fleet turnover are constant over 10 years
- that fuel prices as reported in the Australian Institute of Petroleum weekly summary of prices for the “Metropolitan Average” and “Regional Average” in the week of 5 March 2023 remain constant
- average cost of fuel calculated using 79.94% petrol / 20.06% diesel equivalent p/L – based on percentage of petrol/diesel passenger vehicles in the Australian fleet

Electric vehicle growth calculations make the following assumptions:

- that changes to fleet composition will be geographically evenly distributed
- that 50% of emissions reductions required to achieve 95g CO₂/km standard are from the sale of electric vehicles

APPENDIX

Table 1: Modelled Fuel Efficiency Standard Scenarios

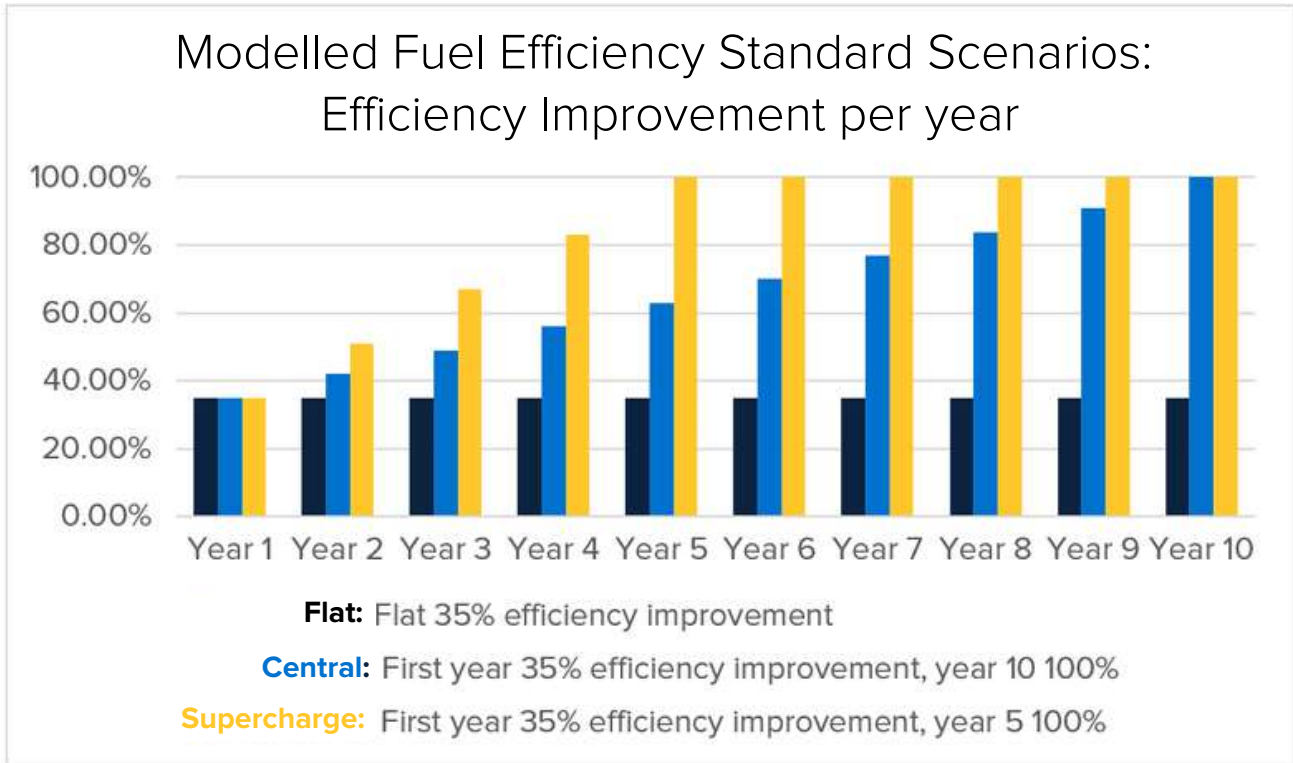


Table 2: Annual and compound fuel cost savings for Australia

	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Flat annual saving	0.6B	1.2B	1.8B	2.4B	3.0B	3.5B	4.1B	4.7B	5.3B	5.9B
Flat compound saving	0.6B	1.8B	3.5B	5.9B	8.9B	12.4B	16.5B	21.3B	26.6B	32.5B
Central annual saving	0.6B	1.3B	2.1B	3.1B	4.1B	5.3B	6.6B	8.0B	9.6B	11.3B
Central compound saving	0.6B	1.9B	4.0B	7.1B	11.2B	16.5B	23.2B	31.2B	40.8B	52.0B
Supercharge annual saving	0.6B	1.5B	2.6B	4.0B	5.7B	7.4B	9.0B	10.7B	12.4B	14.1B
Supercharge compound saving	0.6B	2.0B	4.6B	8.6B	14.3B	21.6B	30.7B	41.4B	53.8B	68.0B

Table 3: Australia Statistics (2020/2021)

Total Vehicles	Passenger Vehicles	LCVs	EVs	5% vehicles	Av fuel cost/L	Annual fuel cost	Population	Dwellings
19.8M	14.7M	3.4M	14255	733962	1.87	33.8B	25.4M	10.9M

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