

ROEV



**Designing an Australian FES for industry,
consumer and environmental outcomes**

Released under the FOIA 382 by the Department of Infrastructure,
Transport, Regional Development, Communications, Sport and the Arts

Designing an Australian FES for industry, consumer and environmental outcomes

Information Briefing: May 2023

Emissions outcomes, choice and industry growth through thoughtful, efficient FES

- Commercial vehicle and Passenger vehicle segments as defined in the ADRs should have unique targets reflecting the unique demands Australians have on their vehicles
- **Appendix A** includes detailed optimal targets. To accelerate EV supply and attract local investment in Australian made EVs, the initial fuel efficiency target should be:
 - Set at 109.3g/km CO₂ (4.7L/100km Petrol) for Passenger Vehicles (2024)
 - Set at 153.4g/100km (6.6L/100km Petrol) for Light Commercial Vehicles (2024)
 - Reduce by at least 4.75% per year until meeting and tracking EU targets
- EV Super Credits tuned to favour local production of vehicles will deliver outsized EV supply outcomes by accelerating permanent local supply capacity and effects of scale
- **Appendix B** shows annual emissions reduction through FES inclusion of a policy of '5 Super Credits for minimum local content EV' doubles the rate of emissions reduction of adopting strict fleetwide emissions targets
- Optimal outcomes are achieved through a sliding-scale of Super-Credits according to local content and jobs impact, optimised to attract investment and local EV production
 - Whole new EVs assembled in Australia using Australian manufactured battery cells receive 10 EV Super Credits per 1 EV sold
 - Whole new EVs assembled in Australia using battery packs assembled in Australia receive 5 EV Super Credits per 1 EV sold
 - EV conversions assembled in Australia using packs assembled in Australia should receive 5 EV Super Credits per 1 EV converted
 - Electric vehicle conversions assembled in Australia using packs assembled elsewhere should receive 2 EV Super Credits per 1 EV converted
- Qualification for 'local content' Super Credits should require at least the installation of energy-store (battery) and propulsion system (e-motors) in Australia
- Roev has applied industry data and developed a helpful tool to design FES scheme parameters that optimise short-and-long-term supply of EVs, avoid vehicle ownership cost increases, minimise industry push-back, and that drives uplift in local jobs and investment
- Hybrid and Plug-in Hybrid technology does not have commercial barriers and so any Super Credit scheme should avoid Super Credits for the supply of this vehicle technology
- The Roev FES design proposal (Appendix A) will deliver over and above existing proposals:
 - Avoidance of vehicle ownership cost increases in early years
 - Competitive EV supply conditions vs competing markets accounting for real markets
 - Increased OEM investment in clean vehicle technologies and electrification
 - Accelerated supply from new EV manufacturers and brands
 - Accelerated near-term local supply of EVs and associated economic benefits
 - More attractive new EV pricing and more zero emission vehicle options

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Section by Section Feedback

Assumptions:

Consultation paper

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.

Recommended changes

- *“Apply only to vehicles entering the Australian market for the first time” unnecessarily precludes the mass-electrification of new and near-new vehicles from organisations such as Roev, SEA Electric, GB Auto, Tembo and Mevco. Where OEMs have failed to invest in global-scale platform electrification, efficient and effective Australian companies have stepped into the void. The FES should avoid design assumptions that preclude emerging segments of the market from participation*
 - *Example remedied framing - “Apply only to vehicles with VINs registered as electric vehicles in the Australian market for the first time. The Australian FES will apply whether vehicles are imported, converted domestically or manufactured domestically. It will not apply to vehicles on-sold in the domestic used car market.”*
 - *Such a framing can be validated or audited through periodic NEVDIS reporting in the same way ‘plate fees’ are determined periodically for light touch administration.*

Consultation paper

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

Recommended changes

- *“Apply across the entire vehicle fleet for each vehicle supplier. The Australian FES will be designed to protect the continued availability of the types of vehicles already in the market. The overall incentive of the FES will be to bring forward clean vehicle technologies into the market, rewarding vehicle users with lower fuel bills and a greater choice of clean vehicle technologies.*
- *As written in the FES Consultation Paper, the statement implies that the light commercial vehicle segment and broader 4x4 segments are unable to be readily transformed by clean vehicle technologies. The current approach is a powerful and flawed policy false premise that limits vision and outcomes without presenting a case for such implied assertions.*

- The FES should recognise the patterns of legacy industry policy pressure in other markets, noting the incredible scale of response possible once the dust of efficiency standards settles.
- Most legacy large scale OEMs have families of ICE engines and hybrid systems in the Australian market or other regions that can significantly improve fuel efficiency with no effects on towing or range - two often-cited factors sensitive in regional Australia. Transitional technologies such as alternator-replacing mild-hybrids and bell-housing mounted hybrid and PHEV technologies are not overly challenging to integrate with existing platforms. These require around 6 months of engineering and validation to bring to market.
- Australian FES should recognise that while Australia is a relatively small and right-hand-drive market, corporate decisions on clean vehicle technologies are not commanded by larger markets, but rather a balance of risk and profitability decisions. Australia's moves on FES design from a system-balance view can have cascading effects on technology timelines, despite the arguments put forward by local sales agencies representing the most profitable policy standpoints for their international parent organisations.
- Considering the LCV and Passenger Vehicle markets as requiring separate fuel efficiency targets is rational, reflective of market forces, and enables FES pressure to be applied equitably and equally across vehicle segments. LCV segment vehicles for example include minimal technologies enabling efficiency due to their legacy focus on emerging markets, whereas vehicle manufacturers now have deep pools of efficiency technologies in their 'parts bins' enabling rapid, early efficiency gains.
- It is not appropriate to consider LCV and Passenger Vehicle markets as one due to inequitable distribution of incentives across OEMs and reduced emissions impacts. Instead, appropriate target setting by segment leaves no vehicle users behind in the growth of clean vehicle technologies in their preferred vehicle type.

Consultation paper

For the purposes of this consultation, 'light vehicles' mean passenger (M category) or commercial (N category) vehicles under 3.5 tonnes gross vehicle mass. They include sedans, wagons, Sports Utility Vehicles, utes, 4-wheel drives, vans, but does not include motorcycles (L category vehicles). Consideration will be given to ensure a FES covers all appropriate vehicles and does not create an incentive to adopt alternative classifications for the purpose of avoiding being covered by a FES

Feedback

- A vector of workarounds to be wary of is the capacity of FCAI members to override and self-appoint vehicle models into sales segments.
- A reasonable protection against such practices for the FES would be:
 - define applicable vehicle categories according to Type Approval

- Notable workarounds by major vehicle suppliers are not uncommon, such as the move of the vehicle supplier of the Toyota Landcruiser 70 series to increase GVM over 3,500 kg to avoid NA category safety improvements required by the Australian Design Rules.
- A reasonable protection against such practices for the FES would be:
 - Vehicle models supplied under a Type Approval into the Australian market in 2023 under one vehicle category, may be considered under the FES to continue to be measured against the requirements of that category if in the future years of the FES even if they receive a Type Approval for supply under another category.

Consultation paper

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.

Feedback

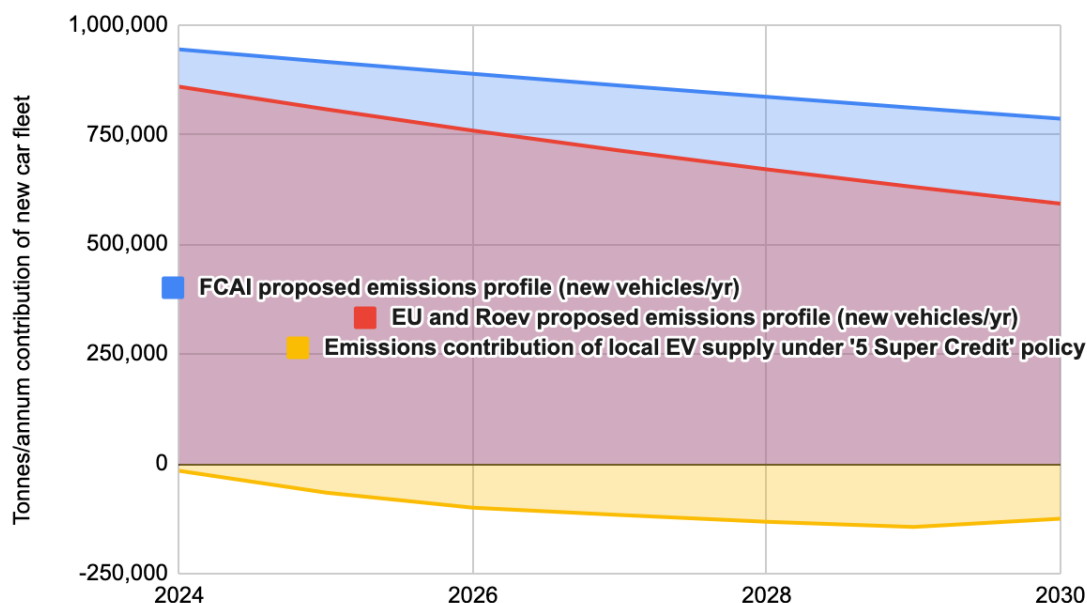
- Learning from FESs in other markets provides a starting place and concepts that have market acceptance and are most simple to communicate
- Rather than being limited by Departmental focus, FES policy must seek to simultaneously achieve Australian outcomes of jobs, industry investment, defence force capability and supply chain development for national sovereignty and security
- The FES applies a market-forces approach that has the potential scale of impact on industry investment and local jobs equivalent to the National Reconstruction Fund
- The Net Zero Committee of Cabinet is the appropriate body to ensure outcomes that support broader remit of government and Roev commends Minister King's establishment of the Net Zero team to drive this agenda

Roelv FES design question feedback

Are there any design assumptions that you think will put at risk the implementation of a good FES for Australia?

- Mass-electrification of new and near-new vehicles from organisations such as Roelv, SEA Electric, Tembo and Mevco will deliver upwards of 100,000 EVs to the Australian markets prior to the arrival of BEV options from legacy OEMs, according to their own statements via the FCAI. Where OEMs have failed to invest in global-scale platform electrification, efficient and effective Australian companies have stepped into the void. Organisations such as those above which have gone through a full engineering validation process will contribute as much as the combined emissions savings of the legacy high volume ICE vehicle suppliers combined to 2030.
- If safe and professionally developed new and near-new EV conversions at-scale are excluded from FES policy inclusion at the point of design assumptions, FES will deliver:
 - Significantly lower emissions outcomes to 2030 ~ 0.5x
 - Thousands of unrealised jobs, billions in economic turnover and tax lost
 - 10-20GWh per year equivalent of battery off-take potential from the burgeoning Australian critical minerals and battery industry
 - An 'us and them' FES delivering less options for consumers and businesses
 - A less competitive economy with reduced opportunities for improved total cost of ownership through zero emissions technology
- The FES should avoid design assumptions that preclude emerging segments of the market from participation
- The following graph presents the relative improvement to net emissions outcomes (contribution of the FES-governed vehicle fleet per year) - showing in yellow the expected contribution of the professional retrofit sector, as compared to the maximum capacity of industry to reduce emissions year-on-year.

Roev (&EU) proposed emissions profile (new vehicle contribution per year vs FCAI proposal)



- Applying FES to “vehicles with VINs registered as electric vehicles in the Australian market for the first time” is the most appropriate framing, capturing the new and used vehicle conversions market, parallel imports market, and all type approval vehicle supply pathways.

What principles should we consider when setting a CO2 target, and how far ahead should they be set? What should the FES average annual emissions ceiling (CO2 target) be?

- A fuel efficiency target with associated trading of carbon credits is a cost-effective tool to accelerate the local EV and battery industry where the dirtiest car makers either invest in clean vehicle technology or pay for their competitors to do so.
- The successful philosophy in EU/US was to set a *stretch* fuel efficiency target and allow OEMs to temporarily bridge to achieving the result through EV ‘Super Credits’. In Europe, each EV sold into the market can be counted as ‘two’ vehicle sales to lower the average emissions contribution per vehicle of an OEMs vehicle fleet.
- To accelerate EV supply and attract local investment in Australian made EVs, the initial fuel efficiency target should be:
 - Set at 109.3g/km CO2 (4.7L/100km Petrol) for Passenger Vehicles (2024)**
 - Set at 153.4g/100km (6.6L/100km Petrol) for Light Commercial Vehicles (2024)**
 - Reduce by at least 4.75% per year until meeting and tracking EU targets.**
- These values are derived as a ‘stretch’ for established vehicle OEMs that is sufficient to incentivise their increased investment in capacity to supply. The figure is marginally lower than the targets successfully achieved under the EU regulatory regime and is set

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- to ensure targets are achievable, responsible, and deliver total ownership cost benefits.
- 'Super Credits' reward vehicle suppliers for bringing zero emissions vehicles to market, underwriting the risk for private investment in EV factories and supply chains by offering a bonus 'multiplier' of the number of 0g/km vehicles accounted for in each sale.
- With Europe removing these temporary Super Credits from 2023, Australia can attract EV volumes from 2023 by offering similar Super Credits to the European regime. **It is anticipated through modelling that the net impact to fleetwide emissions abatement can be doubled to 2030 through careful Super Credit design favouring local investment and production.** Allocating Super Credits to attract investments in locally manufactured EVs serves to establish resilient local supply chains that thrive even as Super Credits are abated.
- **Commercial vehicle and Passenger vehicle segments as defined in the ADRs should have unique targets reflecting the unique demands Australians have on their vehicles.**
- Roev believes there is an ideal start and end point to the ceiling for fuel efficiency over time. Targets by year proposed below maximise the annual improvement in fuel efficiency without driving cost of ownership increases - a difficult balance achieved through development of a market model. The proposed commercial vehicle and passenger vehicle segment fuel efficiency / emissions target that delivers:
 - Avoidance of overall ownership cost increases;
 - Sufficient incentive and time for OEMs to respond with clean vehicle technologies; and
 - Recognition of the uniqueness of the Australian vehicle market and our dependence on commercial vehicles

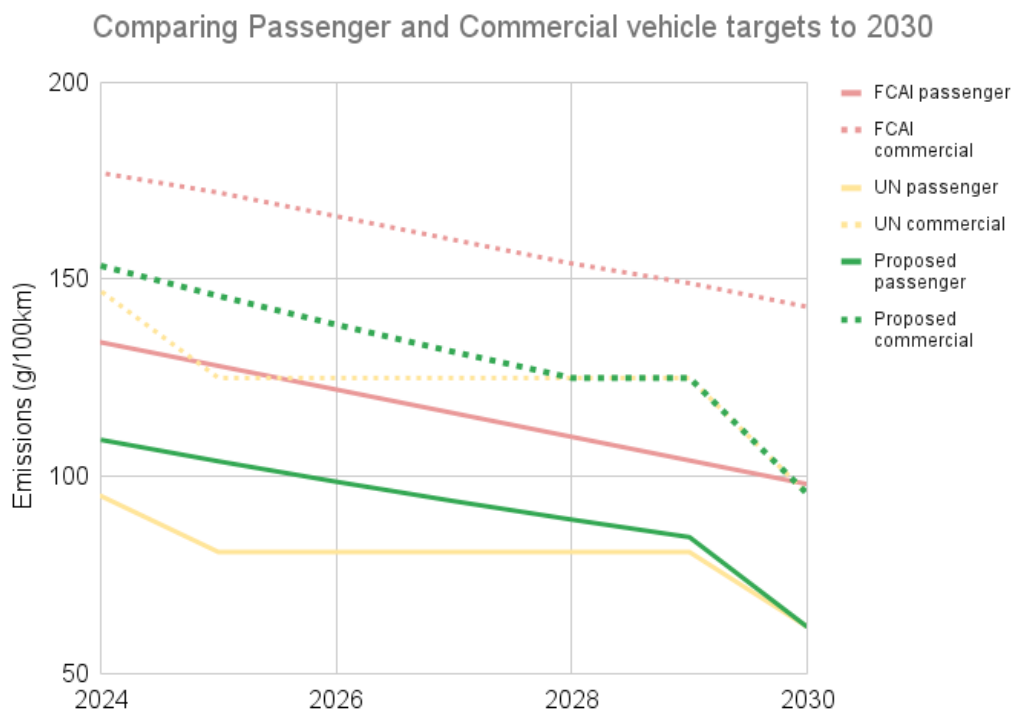
FES model & segment	2024	2025	2026	2027	2028	2029	2030
FCAI passenger	134	128	122	116	110	104	98
FCAI commercial	177	172	166	160	154	149	143
UN passenger	95	80.75	80.75	80.75	80.75	80.75	61.8
UN commercial	147	125	125	125	125	125	95.6
Proposed passenger	109.3	103.8	98.6	93.7	89	84.5	61.8
Proposed commercial	153.4	145.8	138.5	131.5	125	125	95.6

- Roev recommends implementation of the reference masses put forward through published FCAI FES system concepts. These are captured in the table below and accurately reflect the mass of vehicles that consumers in Australia buy, and reflect an appropriate growth rate of mass for clean vehicle technologies and safety advancements. Reflecting a different reference mass would negatively impact consumer choice.
- Despite alignment to the FCAI published reference masses, Roev does not recommend adoption of the mass-slope presented by the FCAI. The mass-slope the FCAI presents enables manufacturers to add content to vehicles to increase the vehicle mass to move fuel efficiency targets in a way that exceeds the actual negative effect of mass on fuel

consumption. This is a negative incentive and a fuel economy avoidance strategy and Roev recommends the adoption of the EU standard.

Attribute	2024	2025	2026	2027	2028	2029	2030
Recommended CO2 Target	109.3	103.8	98.6	93.7	88	84.5	61.8
Recommended Reference Mass	1578	1584	1589	1594	1599	1604	1609
Recommended efficiency-to-mass slope (from EU system)	0.033	0.033	0.033	0.033	0.033	0.033	0.033
FCAI efficiency-to-mass Slope	0.07	0.068	0.065	0.063	0.061	0.058	0.056
Proportional difference recommended vs FCAI efficiency-to-mass slope	212%	206%	197%	191%	185%	176%	170%

- It is noteworthy that the FCAI is proposing a negative effect of mass on vehicle efficiency that is generally around twice the effect adopted and successfully operated under by vehicle suppliers through EU policy. The following chart compares the proposed vehicle targets to the FCAI proposed targets and EU market targets.



Key points to observe:

- Proposed Passenger and LCV targets track smoothly towards EU targets by 2028 without setting technically unreachable targets, especially in the near-term years

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- FCAI targets are set very high and do not trend towards targets of other markets
- FCAI targets reflect a 'no solutions' approach to LCV market emissions, with emissions targets set unnecessarily high. This approach favours legacy OEM profit margin retention over incentives to bring new or existing clean vehicle technologies to this market

Whether to incorporate flexibility mechanisms (credit exchange, banking or pooling arrangements) to minimise impacts on consumers which are common features of other FESs.

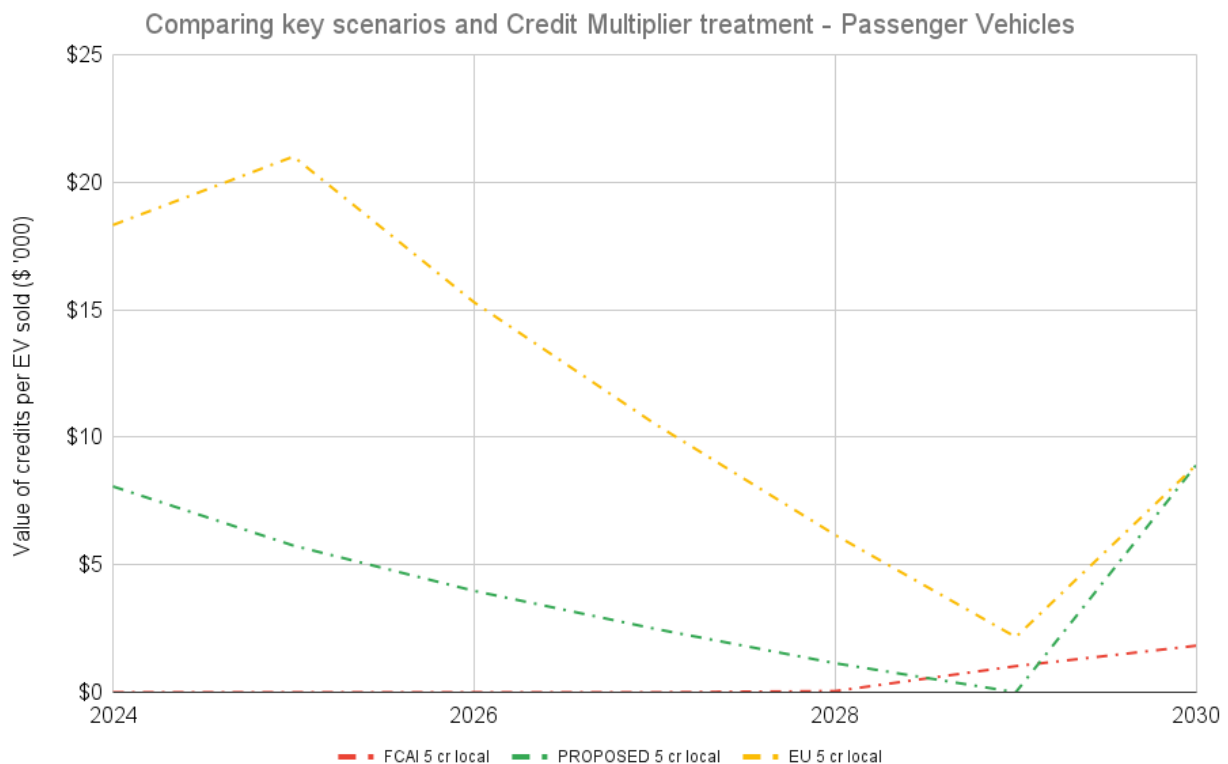
- Credit exchange is a key attribute of a successful fuel efficiency standard. Complex tax and government support structures, enterprise agreements, supply chain commitments and design and development work complicates the path to clean vehicle technologies. Some vehicle suppliers will be unwilling or unable to commit to the proposed fuel efficiency timelines and targets. Where these decisions overlap with highly purchased vehicles or vehicle segments in the Australian market, credit exchange plays an important role facilitating an orderly transition to clean vehicle technologies without de-facto regulating free-choice away from businesses and consumers
- In other jurisdictions the markets with new fuel efficiency or emissions regulations introduced were also the markets within which vehicle suppliers engaged in technical forums such as the European Commission and where they held local manufacturing and engineering capacity. This enabled vehicle suppliers to pivot vehicle development in advance. In the absence of this market condition, the Light Commercial Ute segment in particular requires strong incentives to move the dial. In consideration of this point, the extraordinary and unique profit margins of vehicle suppliers of ICE Utes should be recognised as a powerful buffer from which to support cost effective clean vehicle technologies.
- Organisations such as Roev can develop electrification solutions for around 10% of the development cost expended by legacy vehicle makers because we are focused on optimal drivetrain technology and vehicle safety integration. Our manufacturing investments are also commensurate with 10% of the production volumes and hence we are able to support the EV business case at lower volumes.
- A credit exchange methodology can immediately bring competitive performant EV options to businesses and consumers. Roev for example has been approached by ICE Ute importers around collaborative technical arrangements. If designed appropriately through stretch fuel efficiency targets and a credit exchange methodology, Roev and others technology developers will be able to partner with high volume importers to enable electric options within 12 months. There are therefore pathways under a credit exchange mechanism for large importers of Utes to supplement their ICE vehicle options with EV options under new technical partnerships.

Should bonus credits for new/innovative technologies be included in the FES, and how should any potential risks be managed?

- Roev's proposed FES target start point, reduction profile and end point were modelled against the EU system and FCAI's public policy proposal. Within these models of the market, various Super Credit approaches were modelled under the market-norm 95 Euro per gram CO₂/km exceeded vs target across the fleet.
- The more strict targets of the EU are seen to drive significant fleetwide target 'misses' in the near-term years and hence the value of EV Credits that dirty vehicle importers are willing to pay is higher. These more strict targets drive excessive cost in the nearterm years and these may not be recovered by vehicle users through lower running costs.
- Roev's proposed targets produce a stunning system level outcome when coupled with a sliding scale Super Credit system prioritising locally made or converted EVs. Strong incentives for investment into local EV production/conversion exist in this system design - generating additionality through increased EV supply during a period where vehicle importers have stated they do not intend to mass-produce EV solutions 'from factory'.
- There is no relative disincentive to this system design where the fuel efficiency target is designed with the effective number of system Super Credits in mind. Tougher early-year targets maximise vehicle supplier clean technologies and increase the market for Super Credit purchase, while local content Super Credits enable a responsive EV supply.
- To minimise risks, Super Credits should not be made available to fully imported EVs.
- Locally made conversions supplied to market as new vehicles would be certified to safety standards established for new vehicles.
- Further risk minimisation for locally made conversions when applied to 'used' vehicles should include the setting of a maximum build-date age for applicable conversion set at 2016.
- Minimum safety requirements for converted vehicles to be eligible for Super Credits should focus around active safety system ADRs and not introduce eligibility criteria that are more onerous than existing ADRs. This includes how they are applied to low volume type approvals and should avoid testing that can not be validated effectively in Australia.
- ADR compliance benchmarks for eligibility should apply per the year of manufacture of the original vehicle, with reference to relevant ADR Applicability Tables.
- ADR compliance thresholds for conversions is a likely target of legacy vehicle supplier influence campaigns. They should be designed collaboratively and transparently with performance-based targets rather than prescriptive technology descriptors.
- Such a safety system for used vehicles would:
 - Be certified by the states and territories as an 'in-market' certification, avoiding administrative burden for the Department of Infrastructure.
 - Be certified according to administrative efficiency principles and administrative leadership demonstrated by the Department of Infrastructure.
 - Be established through processes based on the Model Report template and adapted to the specific requirements of safety certification of electric vehicle conversions. This avoids unnecessary duplication, while setting an appropriate

benchmark for establishing, documenting and auditing compliance with certification requirements.

- For the FES to function as designed, there should be no allowable pooling of results across Passenger and Commercial vehicle segments within or between vehicle suppliers.
- A review of the Australian market clearly identifies that such an allowance would heavily unbalance the playing field in the segment with the highest potential for fuel efficiency gains, the Light Commercial Vehicle market.
- **Allowing cross-pooling of results/credits across Passenger and Commercial vehicle segments within or between vehicle suppliers would be a major failure of policy. A FES policy that allowed this would be one that solely optimises the commercial imperative of a small handful of powerful legacy vehicle suppliers. This applies similarly to combining Passenger and Commercial vehicles under one target.**
- The following average economic incentive is modelled to exist to supply additional EVs in the passenger vehicle segment that meet the minimum local content threshold (5x Super Credits) according to various potential FES policy outcomes.



- The more aggressive early targets of the EU policy can be seen to drive significant costs into the vehicle supplier market, beyond their capacity to respond with clean vehicle technology. Roev's proposal attracts increased overall EV supply at a lower cost to the consumer, with there being no year in which businesses or consumers are worse-off economically through either ICE or EV purchase. Such a result is a reasonable baseline expectation of consumers and businesses and should be a strong focus of the FES.

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- Off-cycle clean vehicle technology credits should not generally apply. There are numerous examples of hybrid vehicle technologies applied by certain vehicle suppliers that enable credits that do not actually deliver these in real-world driving. The AAA real world fuel efficiency testing process should be considered as a minimum performance hurdle for these technologies to demonstrate their fuel efficiency driving prowess. If AAA testing falls behind the efficiency claims of WLTP testing protocols, no technology credits should be made available for that vehicle.

When and how the FES should commence.

- More aggressive fuel efficiency targets in the early years of an Australian FES should coincide with 1-2 years of 'fair warning' for those vehicle suppliers that exceed their targets such that a \$0g/km clean vehicle incentive applies.
- The recommended commencement date with such a grace period in place is immediately, or else the market is incentivised to hold back EV volumes as experienced in other markets in advance of regulatory shift.
- While a \$0 clean vehicle incentive (or penalty) would apply to fleetwide fuel efficiency target breaches in the first 1-2 years, vehicles that meet the local supply content eligibility thresholds and registered as Electric Vehicles in the Australian market should receive EV Super Credits that carry over to latter years, to ensure local EV suppliers do not hold-back EV supply to the Australian market.

What level of penalties for non-compliance, and enforcement mechanisms should be established under an Australian FES to be internationally competitive?

- Supply of clean vehicle technologies is determined largely by the net economic advantage of supplying vehicles to one location compared to another. Setting a 'clean vehicle incentive' of 95 EURO equivalent - the same as the key competitive vehicle supply market for Australia - is therefore the lowest responsible target that should be applied.

Governance and other technical matters to ensure the FES is robust, has low administrative costs, and establishes appropriate information disclosure rules.

- The primary means to create and destroy EV credits and Super Credits should be through recorded credit exchange between vehicle suppliers.
- The government should provide the clearing house function, potentially through the establishment of the Zero Emissions Vehicles National Innovation Council (ZEVNIC), where all Super Credit exchange arrangements are transparent.
- ZEVNIC would provide services to the Department of Infrastructure in the same way that NEVDIS services are provided through Austroads.

- Remaining clean vehicle incentives payable by vehicle suppliers would be paid into this clearing house. Such a pool of funds should be required to be used to support EV charging infrastructure, road safety and local industry development.

How should the regulated entity be defined in an Australian FES?

- To enable regulated entities to be managed under the optimal policy design presented in this document, regulated entities should be considered as follows:
 - Type Approval holders importing a minimum threshold of vehicles (compulsory)
 - SEVS vehicle importers (voluntary opt-in)
 - Vehicle converters (voluntary opt-in)

Are there any particular FES features that you think we need to take particular care with?

- Creating Super Credits on a sliding scale supporting local content should not be capped in the number of potential credits available. Vehicle importers should not be eligible for Super Credits to ensure the proper functioning of the FES.
- The Minister, and not their delegates, should retain an overarching ability to warn vehicle suppliers and take rare action against vehicle suppliers if they are suspected of abusing parameters established under the FES. This distinction prevents industry pressure from manifesting off-the-record actions that can distort FES functionality.

Starting emissions level limit and approach • What principles should we consider when setting the targets?

- To accelerate EV supply and attract local investment in Australian made EVs, the initial fuel efficiency target should be:
 - Set at 109.3g/km CO2 (4.7L/100km Petrol) for Passenger Vehicles (2024)
 - Set at 153.4g/100km (6.6L/100km Petrol) for Light Commercial Vehicles (2024)
 - Reduce by at least 4.75% per year until meeting and tracking EU targets.
- More details are provided above on rationale

Starting emissions level limit and approach • What should Australia's CO2 FES target be? • How quickly should emissions reduce over what timeframe? • Should the Australian FES start slow with a strong finish, start strong, or be a straight line or take a different approach?

- To maximise overall emissions reduction and local outcomes for jobs and investment, a more aggressive approach to early targets is recommended.
- This should coincide with 1-2 years of 'fair warning' for those vehicle suppliers that exceed their targets such that a \$0g/km clean vehicle incentive applies.

- The recommended commencement date with such a grace period in place is immediately, or else the market is incentivised to hold back EV volumes as experienced in other markets in advance of regulatory shift.
- While a \$0 clean vehicle incentive (or penalty) would apply to fleetwide fuel efficiency target breaches in the first 1-2 years, vehicle that meet local content minimum thresholds and that are registered as EVs in the Australian market for the first time should receive EV Super Credits that carry over to latter years, to ensure local EV suppliers do not hold-back EV supply to the Australian market.
- The 'fast finish' approach to emissions both enables higher overall cumulative emissions from the vehicle fleet, but also optimises for large vehicle supplier margins, rather than incentivising prioritisation of clean vehicle technologies for the Australian market. The Light Commercial Vehicle segment for example is an ultra-dirty, ultra-high-margin market segment requiring the FES market signal to kick off clean vehicle technology integration.

Attribute-based emissions limit curve • Should an Australian FES adopt a mass-based or footprint-based limit curve? • If Australia adopts a mass-based limit curve, should it be based on mass in running order, kerb mass, or another measure? • Should Australia consider a variant of the New Zealand approach to address incentives for very light and very heavy vehicles? If so, noting that new vehicles that weigh under 1,200 kg are rare, where should the weight thresholds be set?

- A foot-print based fuel efficiency standard is not sensible as there is no relationship between vehicle footprint and fuel efficiency. Such a system would disincentive the addition of active and passive safety systems which incur weight increases (and fuel efficiency increases), but which do not affect footprint.
- A mass-based fuel efficiency limit curve is appropriate when the incentive for mass changes is minimised. Roev considers the EU system efficiency-to-mass limit curve of straight 0.033 slope is appropriate, based on FCAI reference masses by year.

Attribute	2024	2025	2026	2027	2028	2029	2030
Recommended CO2 Target	109.3	103.8	98.6	93.7	88	84.5	61.8
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Proportional difference recommended vs FCAI efficiency-to-mass slope	212%	206%	197%	191%	185%	176%	170%

- It is noteworthy that the FCAI is proposing a negative effect of mass on vehicle efficiency that is generally around twice the effect adopted and successfully operated under by vehicle suppliers through EU policy.

Multiple targets • Should an Australian FES adopt two emissions targets for different classes of vehicles? • Is there a way to manage the risk that adopting two targets erodes the effectiveness of an Australian FES by creating an incentive to shift vehicle sales to the higher emission LCV category? • Is there anything else we should bear in mind as we consider this design feature? • Are there other policy interventions that might encourage more efficient vehicle choices?

- Australia should adopt two emissions targets for the reasons described above. These targets are Passenger segment (Passenger, SUV in FCAI/market language) and Light Commercial segment.
- **Commercial vehicle and Passenger vehicle segments as defined in the ADRs should have unique targets reflecting the unique demands Australians have on their vehicles.**
- Roev believes there is an ideal start and end point to the ceiling for fuel efficiency over time. Targets by year proposed below maximise the annual improvement in fuel efficiency without driving cost of ownership increases - a difficult balance achieved through development of a market model. The proposed commercial vehicle and passenger vehicle segment fuel efficiency / emissions target that delivers:
 - Avoidance of overall ownership cost increases;
 - Sufficient incentive and time for OEMs to respond with clean vehicle technologies; and
 - Recognition of the uniqueness of the Australian vehicle market and our dependence on commercial vehicles

FES model & segment	2024	2025	2026	2027	2028	2029	2030
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- The most significant near-term opportunity for improved fuel efficiency and emissions abatement exists in the LCV segments. To ensure there is focus on bringing clean vehicle technologies to this segment - which is a significant driver of overall profit margins for many legacy vehicle suppliers - there must be a unique target for the LCV segment. Critically, EV credits and Super Credits must not be able to be pooled between LCV and Passenger segments within or between vehicle suppliers.
- Local content Super Credits should be front of mind when considering this aspect of FES market design. Local jobs and investment outcomes are achievable through FES, while such features of FES also lock in long-term local supply through investment attraction and early price competitiveness.

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- Local-supply friendly FES policy further leverages other government focus on supply chain establishment in battery technologies, critical minerals and advanced manufacturing. This design for the FES is the optimal outcome as it incentivises the dirtiest vehicle supplier to bring clean vehicle technologies to market, or else to support local investment that does so.

Credit banking, transferring and pooling • To what extent should the Australian FES allow credit banking, transferring and/or pooling? • Should credits expire? In what timeframe?

- The most significant near-term opportunity for improved fuel efficiency and emissions abatement exists in the LCV segments. To ensure there is focus on bringing clean vehicle technologies to this segment - which is a significant driver of overall profit margins for many legacy vehicle suppliers - there must be a unique target for the segment. Critically, EV credits and Super Credits must not be able to be pooled between LCV and Passenger segments within or between vehicle suppliers.
- Tougher earlier targets should be coupled with 1-2 years of 'fair warning' for those vehicle suppliers that exceed their targets such that a \$0g/km clean vehicle incentive applies.
- The recommended commencement date with such a grace period in place is immediately, or else the market is incentivised to hold back EV volumes as experienced in other markets in advance of regulatory shift.
- While a \$0 clean vehicle incentive (or penalty) would apply to fleetwide fuel efficiency target breaches in the first 1-2 years, vehicle registered as EVs in the Australian market for the first time should receive EV Super Credits that carry over to latter years, to ensure vehicle suppliers do not hold-back EV supply to the Australian market. This also supports early establishment of local EV industry investments.
- To effectively create a guaranteed value of credits and incentivise the earlier release of clean vehicle technologies to market, credits carrying forward should not expire or be devalued. Without a clear business case that can account for credits, it is more difficult to invest in the production-readiness of clean-vehicle technologies.

APPENDIX A

Outlining the proposed commercial vehicle and passenger vehicle segment fuel efficiency / emissions target that delivers:

- Avoidance of overall ownership costs;
- Sufficient incentive and time for OEMs to respond with clean vehicle technologies; and
- Recognition of the uniqueness of the Australian vehicle market and our dependence on commercial vehicles

Vehicle segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
CCA proposal '14	168	157	146	137	128	120	112	105					
FCAI passenger			154	150	146	140	134	128	122	116	110	104	98
FCAI commercial			197	193	189	183	177	172	166	160	154	149	143
UN passenger			95	95	95	95	95	80.75	80.75	80.75	80.75	80.75	61.75
UN commercial			147	147	147	147	147	125	125	125	125	125	95.6
Proposed passenger							109.3	103.8	98.6	93.7	89	84.5	61.8
Proposed commercial							153.4	145.8	138.5	131.5	125	125	95.6

RoEV recommends implementation of the reference masses put forward through published FCAI reports. These accurately reflect the mass of vehicles that consumers in Australia buy, and reflecting a different reference mass would negatively impact consumer choice.

Despite alignment to the FCAI published reference masses, RoEV does not recommend adoption of the mass-slope presented by the FCAI. The mass-slope the FCAI presents enables manufacturers to add content to vehicles to increase the vehicle mass to move fuel efficiency targets in a way that exceeds the actual negative effect of mass on fuel consumption. This is a negative incentive and a fuel economy avoidance strategy and RoEV recommends the adoption of the EU standard.

Attribute	2024	2025	2026	2027	2028	2029	2030
Recommended CO2 Target	109.3	103.8	98.6	93.7	88	84.5	61.8
Recommended Reference Mass	1578	1584	1589	1594	1599	1604	1609
Recommended efficiency-to-mass slope	0.033	0.033	0.033	0.033	0.033	0.033	0.033
FCAI efficiency-to-mass Slope	0.07	0.068	0.065	0.063	0.061	0.058	0.056
Proportional difference recommended vs FCAI	212%	206%	197%	191%	185%	176%	170%

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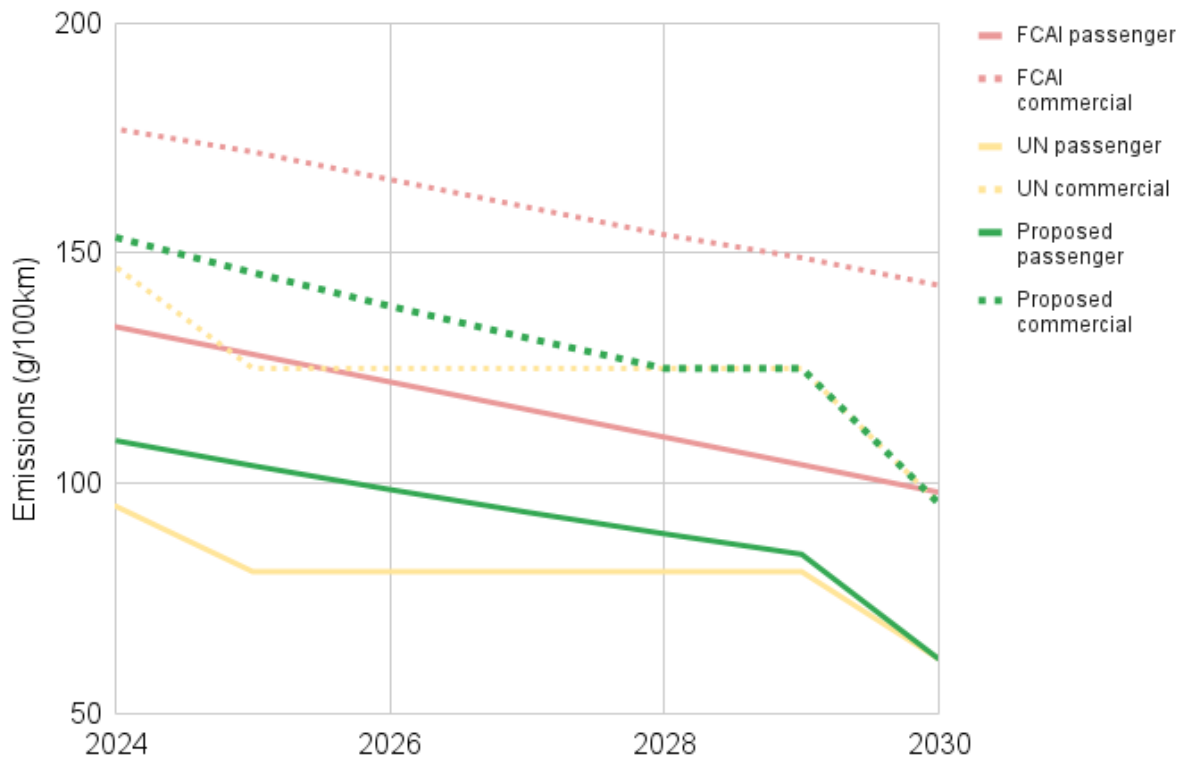
efficiency-to-mass slope							
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It is noteworthy that the FCAI is proposing a negative effect of mass on vehicle efficiency that is generally around twice the effect adopted and successfully achieved under the EU policy.

The following chart compares the proposed passenger and commercial vehicle targets to the FCAI proposed targets and EU market targets. Key points to observe:

- Proposed Passenger and LCV targets track smoothly towards EU targets by 2028 without setting technically unreachable targets, especially in the near-term years
- FCAI targets are set very high and do not trend towards comparable targets
- FCAI targets reflect a 'no solutions' approach to the light commercial vehicle segment emissions, with emissions targets set unnecessarily high

Comparing Passenger and Commercial vehicle targets to 2030

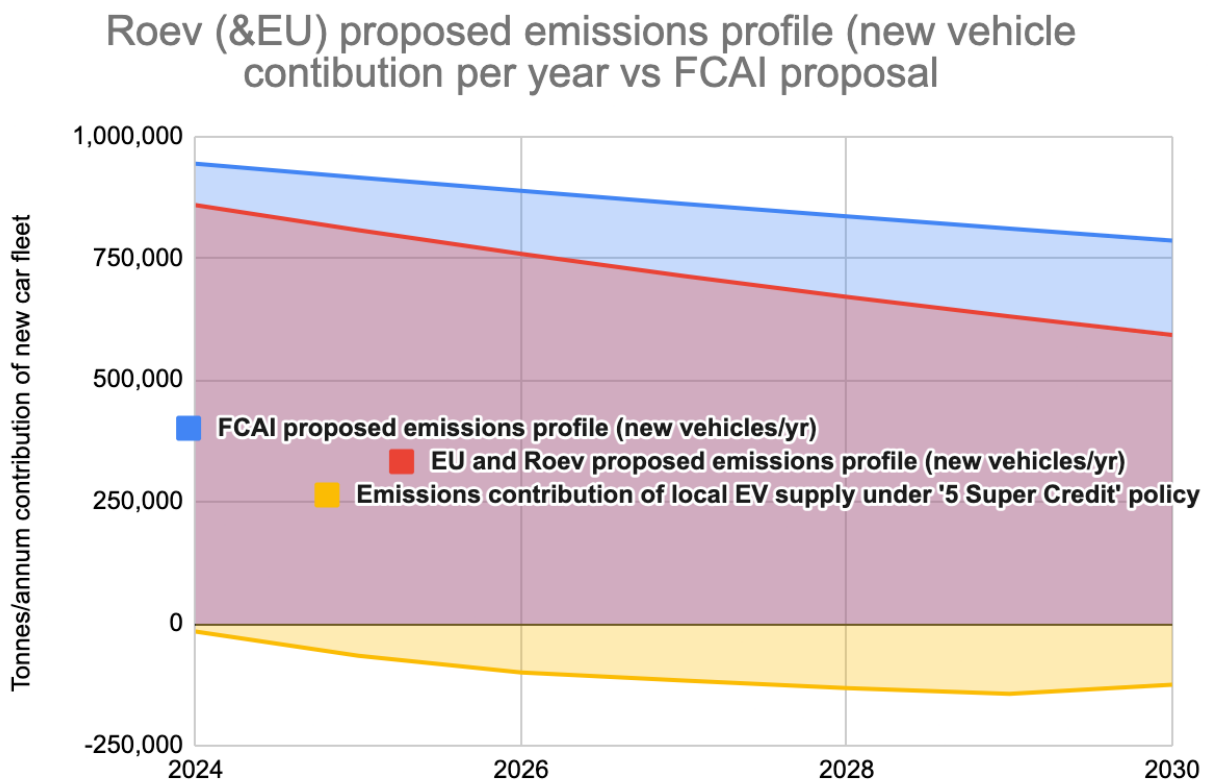


Appendix B: Expected results of proposed fuel efficiency standards

Contribution of Super Credit policy vs more strict emissions targets

Roenv's analysis of the relative contribution of emissions reduction in the new car fleet under FCAI proposed pathway and the maximum potential pathway (EU targets, Roenv proposed targets) is presented below.

Most impactfully, the anticipated additional contribution by Roenv alone under the inclusion of '5 Super Credits for local supply' policy in the Fuel Efficiency Standards shows the rate of aggregate emissions reductions can approximately double through this policy inclusion alone.

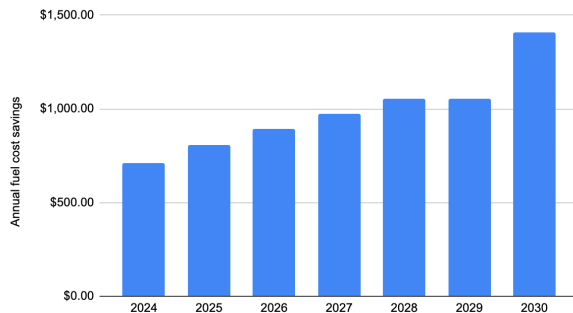


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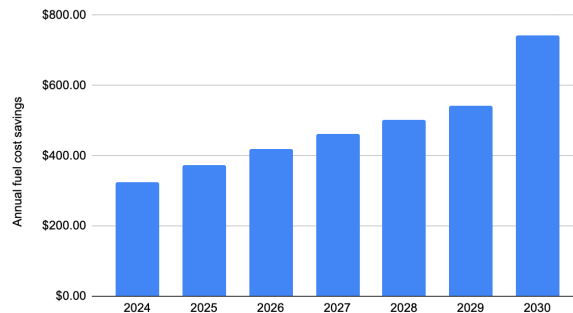
Light Commercial and Passenger vehicle annual fuel cost savings vs year of purchase

More strict new vehicle fuel efficiency targets deliver more beneficial fuel cost savings. At 2022 average fuel prices, the all-of-fleet average annual fuel savings for new light commercial and light passenger vehicles is provided below. Light commercial vehicles travel higher mileage (>15,000km) vs 11,100km average for passenger vehicles. As such, LCV fuel cost savings are higher in all years than for passenger vehicles.

Light Commercial vehicle annual fuel cost savings vs year of purchase



Passenger vehicle annual fuel cost savings vs year of purchase

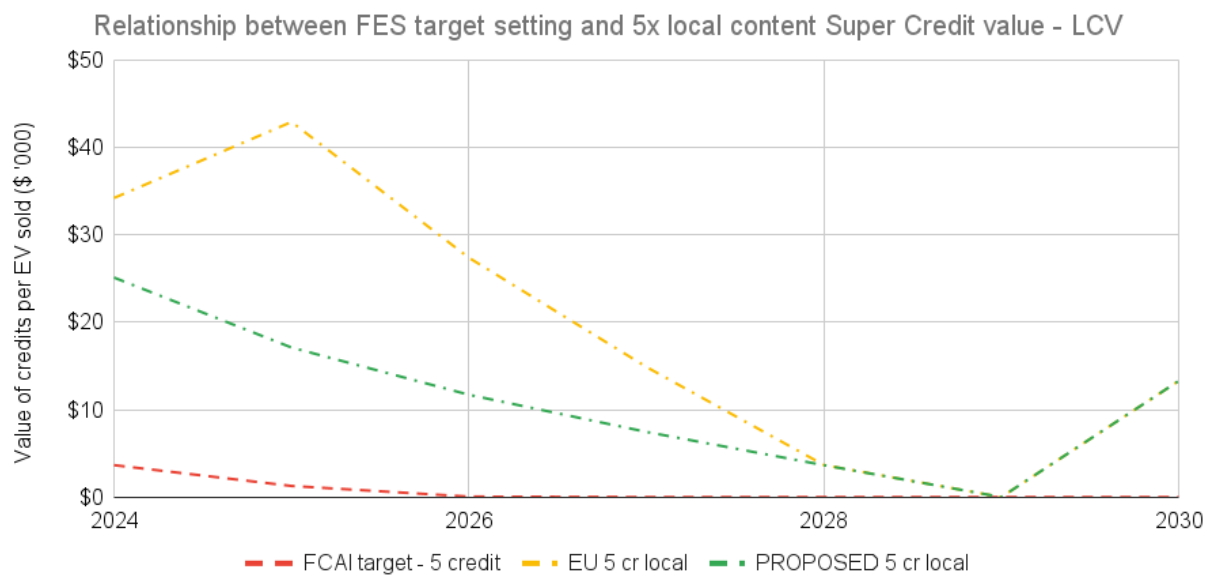


Many new vehicles travel even further than the average annual mileage, providing even better economic return for the clean vehicle technology. Electric vehicles reduce running costs by around 75-80% per km, which can make those vehicles even more cost effective to own than even the most fuel efficient ICE vehicle.

Average economic incentive to supply additional electric vehicles meeting the minimum local content threshold

Vehicle supply is split into 2 key stakeholders; The designer/manufacturer, and the Australian sales office or representatives. The designer/manufacturer seeks to produce very high volumes of products and distribute them to national sales offices across the globe. Profit drives the final supply location attached to the window of the vehicle as it rolls off the production line.

Economic incentives such as the Super Credit scheme work to move the attractiveness of supplying highly limited EVs from one location to another. The following average economic incentive is estimated to exist to supply additional electric vehicles in the light commercial vehicle market that meet the minimum threshold for local content (5x Super Credits).



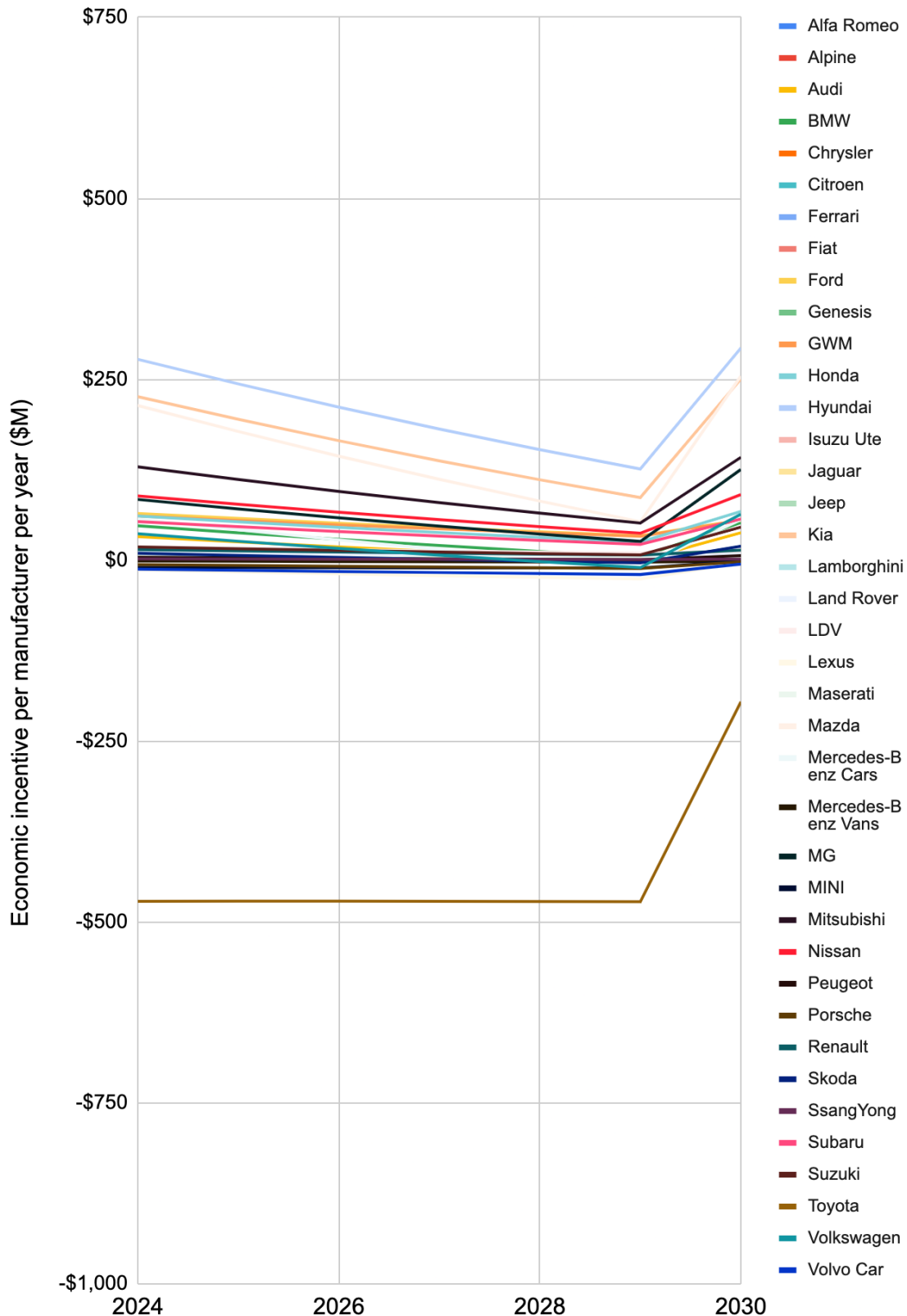
The yellow line which is higher represents the effect of the more aggressive EU targets, vs the proposed targets represented by the green line.

Roever's proposal attracts increased overall EV supply at a lower cost to the consumer, with there being no year in which businesses or consumers are worse-off economically through either ICE or EV purchase.

It is Roever's estimation that applying the harsher EU target to this segment in the early years would significantly reduce supply of these highly popular vehicles to market, while exceedingly low targets provide little incentive to bring clean vehicle technologies to this market.

Proposed policy outcomes (passenger) - Economic incentive for clean technologies

Proposed Scenario/Passenger vehicles - Economic incentive for clean technologies



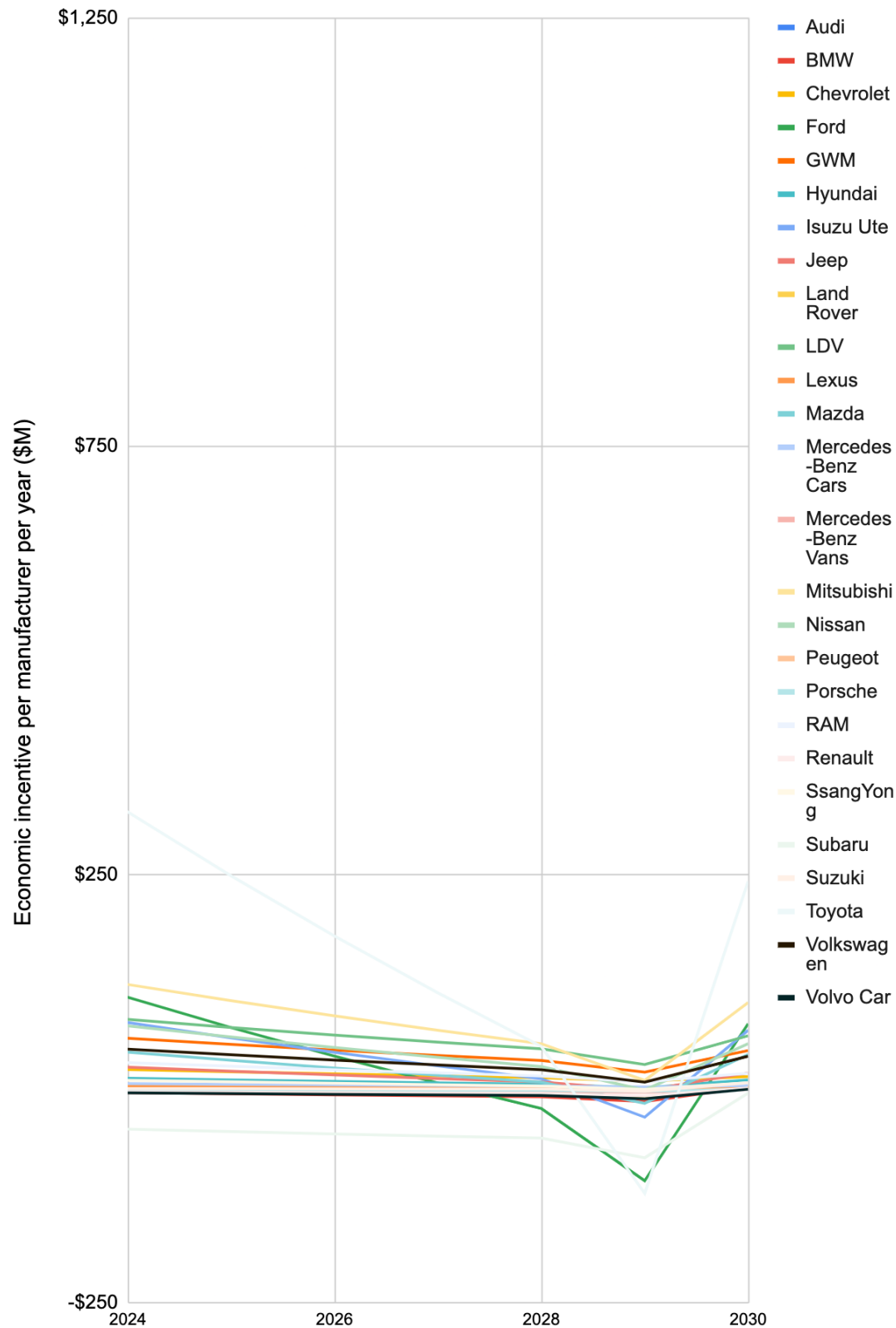
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In the outcomes above for passenger vehicles, Toyota is the standout case with the cleanest fleet, and hence with the least economic incentive to bring clean vehicle technologies. It is important to avoid excessive off-cycle credits as Toyota's outcomes presented above are based on the off-cycle credit optimised FCAI scheme for computing fleet-wide results. Hyundai, Kia and Mazda are the three vehicle suppliers with the greatest incentive to clean their fleet emissions.

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Proposed policy outcomes (LCV) - Economic incentive for clean technologies

Proposed Scenario/LCV vehicles - Economic incentive for clean technologies



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The most incentivised to develop and bring to market clean vehicle technologies in the light commercial vehicle space are Toyota, Mitsubishi and Ford. Across both light commercial and passenger vehicles the largest incentive is to Toyota, Ford, Hyundai, Kia and Mazda.

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