

## Attachment A - Summary table of key elements of efficiency standards adopted by different jurisdictions

Jurisdiction	European Union	United States	Canada	New Zealand
Current emissions intensity <sup>1</sup> (grams of CO <sub>2</sub> per km)	96g/km (2021, passenger vehicles) 158g/km (2021, light commercial vehicles)	114g/km (2022, passenger vehicles) 170g/km (2022, light trucks <sup>2</sup> )	112g/km (2022, passenger vehicles) 170g/km (2022, light trucks)	152g/km (2021, passenger vehicles) 213g/km (2021, light commercial vehicles)
Targets <sup>3</sup>	Standard for 2025 equivalent to: 77g/km in 2025 for passenger vehicles 123g/km for light commercial vehicles Standard for 2030 equivalent to: 40g/km for passenger vehicles. 72g/km for light commercial vehicles	Standard for 2026 equivalent to: 79g/km for passenger vehicles 118g/km for light trucks Standard for 2032 equivalent to: 38g/km for passenger vehicles 50g/km for light trucks	Currently adopts US EPA standard by reference Standard for 2026 <sup>4</sup> equivalent to: 76g/km for passenger vehicles 120g/km for light trucks Zero emission vehicle mandate <sup>5</sup> phased in from 2026 (20% of sales) to 2035 (100% of sales).	Currently under review. Current standard for 2027 equivalent to: 57g/km for passenger vehicles 69g/km for light commercial vehicles

<sup>1</sup> Different test procedures are used to measure CO<sub>2</sub> in each market. As Australia currently uses the NEDC test cycle, these have been converted to an NEDC equivalent based on estimates by the [International Council for Clean Transportation \(ICCT\)](#)

<sup>2</sup> US and Canadian standards deem most 4WD SUVs to be 'light trucks', as well as utes and vans.

<sup>3</sup> Targets are normalised to NEDC. Target data supplied by the ICCT.

<sup>4</sup> As the US and Canadian standards are adjusted by vehicle footprint, the US and Canadian targets may differ slightly due to difference in sales

<sup>5</sup> Plug-in hybrids may be sold to meet the Canadian zero emission vehicle mandate

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Reduction required <sup>6</sup>	58% reduction (on 2021 levels) for passenger vehicles by 2030.  54% reduction (on 2021 levels for light commercial vehicles) by 2030.	67% reduction (on 2022 levels) for passenger vehicles by 2032.  71% reduction (on 2022 levels) for light trucks by 2032.	As per US EPA standard.	62% reduction (on 2021 levels) for passenger vehicles by 2027.  68% reduction (on 2021 levels) for light commercial vehicles by 2027.
Application of standard	Two mass-based limit curves (one for passenger and one for light commercial vehicles).  SUVs regulated as passenger vehicles.  Limit curve targets change every five years.  CO <sub>2</sub> measured using 4 phase WLTP from 2021.	Two footprint-based limit curves (one for passenger and one for light trucks).  Most 4WD SUVs regulated as light trucks.  Limit curves targets become more stringent annually.  Fuel economy and CO <sub>2</sub> measured using US Federal Test Procedure.	As per US EPA standard.	Two mass-based limit curves (one for passenger and one for light commercial vehicles).  SUVs regulated as passenger vehicles.  Limit curve targets become more stringent annually.  CO <sub>2</sub> measured using 3 phase WLTP conversion procedure developed by ICCT.

<sup>6</sup> Based on most recent data available for other markets.

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Multiplier credits (super credits)	<p>Multiplier of 2 for vehicles under 50g/km in 2020. Reduced to 1.67 in 2021 and 1.33 in 2022. No multiplier from 2023.</p> <p>Manufacturers with more 25% of passenger and 18% of light commercial vehicles under 50g/km eligible for relaxed CO<sub>2</sub> target from 2025 to 2029.</p>	<p>In 2023 and 2024:</p> <p>Multiplier of 1.5 for battery EVs and fuel cell EVs, 1.3 for plug in hybrids. Capped at 6.2g CO<sub>2</sub>/km over the 2 years from 2023-2024<sup>7</sup>.</p> <p>10g/mile (6.2g/km) allowance for mild hybrid and 20g/mile (12.4g/km) allowance for strong hybrid full size pickup trucks.</p> <p>No super credits from 2025.</p>	As per US EPA standard.	No

<sup>7</sup> From Bui. A and Yang, Z, *U.S. light-duty vehicle greenhouse gas standards for model years 2023–2026 and corporate average fuel economy standards for model years 2024–2026*, International Council for Clean Transportation, <https://theicct.org/wp-content/uploads/2022/07/update-us-ghg-cafe-standards-1-jul22.pdf>, page 6.

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Off cycle credits	Credits of 7g CO <sub>2</sub> /km available for approved technologies.	<p>Up to 9.3g/km in credits available for a range of approved technologies. Gradually reducing to zero from 2027 to 2033.</p> <p>Credits up to 3g/km for passenger vehicles and 4.5g/km for light trucks for more efficient air conditioning systems.</p> <p>Credits of up to 8.6g/km for passenger vehicles and 10.8g/km for light trucks using refrigerants with a lower global warming potential. These credits will be phased-down from 2027 to 1g/km for cars and 1.2g/km for light trucks in 2031.</p>	As per US EPA standard.	No
Credits/Flexibilities	Allows suppliers to comply as a group. No credit banking or trading.	<p>Allows credits to be accrued for surpassing standard.</p> <p>Credits can be carried forward, carried back or traded.</p>	As per US EPA standard.	<p>Allows credits to be accrued for surpassing standard.</p> <p>Credits can be carried forward, carried back or traded.</p>

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Jurisdiction	European Union	United States	Canada	New Zealand
Penalty per vehicle in local currency	€95 per g/km target exceedance	<p><b>CAFE standards (administered by NHTSA)</b></p> <p><b>Before 2019</b> \$US5.50 per excess 0.1 mile/gallon shortfall.</p> <p><b>2019 to 2021</b> \$US14 per excess 0.1 mile/gallon shortfall.</p> <p><b>From 2022</b> \$US15 per excess 0.1 mile/gallon shortfall.</p> <p>Additional civil penalties up to US\$37,500 per vehicle may also apply under the Clean Air Act administered by the US EPA.</p>	The Canadian Environmental Protection Act provides for a maximum penalty of \$6,000,000 for first offence, \$12,000,000 for subsequent offences.	<p>New vehicle suppliers: \$NZ45 per excess gram.</p> <p>As second-hand imports account for around 50 per cent of vehicles supplied to New Zealand, New Zealand's standard also applies to second hand imports. Second hand vehicle importers are subject to a reduced penalty of \$NZ 22.50 per excess gram.</p> <p>Note: penalties increase in New Zealand starting in 2025.</p>
Penalty in AUD (Purchasing Power Parity) <sup>8</sup>	\$197 per excess g/km	<p><b>CAFE standards (administered by NHTSA)</b></p> <p><b>Before 2019</b> \$8 per 0.1 mile/gallon shortfall</p> <p><b>2019 to 2021</b> \$20 per 0.1 mile/gallon shortfall</p> <p><b>From 2022</b> \$US22 per 0.1 mile/gallon shortfall (equivalent to \$100 per excess gram of CO<sub>2</sub> per km)</p>	\$7,000,000 for first offence and \$14,000,000 for subsequent offences	<p>New vehicle suppliers: \$44.</p> <p>Used vehicle suppliers: \$22.</p>

<sup>8</sup> Purchasing Power Parity (or PPP) is a mechanism for comparing prices in different locations. We've used it in this paper to help readers compare the prices in different jurisdictions.

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### Scope of standards

In the Australian Design Rules and equivalent UN vehicle regulations, light vehicle standards traditionally apply to passenger and goods carrying vehicles with a gross vehicle mass (GVM) up to 3,500kg. However, to ensure the NVES does not provide an incentive for avoidance by increasing a vehicle's GVM rating, the Government has proposed that the NVES apply to all vehicles that can be driven on a car licence (i.e. vehicles with a GVM up to 4,500kg).

The US standards for light vehicle efficiency apply to passenger vehicles with a gross vehicle mass up to 10,000 pounds (4,536kg) and commercial vehicles with a gross vehicle mass up to 8,500 pounds (3,855kg). Commercial vehicles with a gross vehicle mass over 8,500 pounds (such as the Ford F250) are subject to efficiency standards for medium and heavy-duty vehicles, which set CO<sub>2</sub> emission requirements based on a work factor derived from the vehicle's payload, towing capacity and drive (instead of the vehicle's 'footprint' – see worked example below).<sup>9</sup>




There has been some debate about how larger light commercial vehicles sold in Australia would be covered by the US standards, and which US standard would apply to such vehicles. The US fuel efficiency/vehicle CO<sub>2</sub> emissions policy framework has considerable complexity, with standards operated by the National Highway Traffic Safety Administration (NHTSA), the US Environment Protection Agency (EPA) and additional standards operated by California Air Resources Board (CARB) (which a range of other states have adopted). By contrast, under the proposed New Vehicle Efficiency Standard, Australia would adopt one national standard, without the complex systems of technology credits that apply in the US, providing a streamlined compliance and monitoring framework for manufacturers and the Regulator.

Many of the larger vehicles which are highly popular in the US, referred to as 'trucks', also differ substantively from the utes sold in Australia, but are still covered by either the light duty vehicle emissions standard, or by equivalent standards for medium and heavy-duty vehicles. The table below gives an example of the Ford Ranger, F-150 and F-250. Ford vehicles have been chosen for this example simply because the Ranger and F-150 are top selling vehicles in Australia and the US respectively and are sold in both Australia and the US. Vehicles like the F-250 are not as common in Australia, as they require a heavy vehicle licence.

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<sup>9</sup> 40 CFR §86.1819-14, available at: <https://www.ecfr.gov/current/title-40/section-86.1819-14>

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	Ford Ranger <sup>10</sup>	Ford F-150 <sup>11</sup>	Ford F-250 <sup>12</sup>
Image	 <p>Image source: carsguide.com.au<sup>13</sup></p>	 <p>Image source: Drive.com.au<sup>14</sup></p>	 <p>Image source: ford.com<sup>15</sup>, Super Duty F-250 XL shown.</p>
Australia sales 2023 (VFACTS)	63,536	145 Note, released late 2023, year to date sales to March 2024 are 616.	Not sold as new vehicle through Type Approval pathway in Australia.
Dimensions <sup>16</sup>	Length: 5,225mm to 5,380mm Width: 2,208 mm Height: 1,886mm to 1,926mm	Length: 5,884mm to 6,184mm Width: 2,430mm Height: 1,995mm	Length: 5888mm to 6761mm Width: 2,690mm Height: 2004mm to 2,073mm
Kerb mass	1,783 to 2,473kg	2,451kg to 2,555kg	2,584kg to 3,474kg
GVM	3,130 to 3,350kg	3,220kg to 3,265kg	5,143 to 5,415kg
Payload capacity (kg)	657kg to 1,447kg	685kg to 784kg	1,520kg to 1,935kg

<sup>10</sup> Vehicle data source: [https://www.ford.com.au/content/dam/ecom/Release-3/AU/p703/brochure/FORDVF0603\\_2024.50MY%20Ranger%20Brochure%20Master\\_2Feb.pdf](https://www.ford.com.au/content/dam/ecom/Release-3/AU/p703/brochure/FORDVF0603_2024.50MY%20Ranger%20Brochure%20Master_2Feb.pdf), accessed 8 April 2024

<sup>11</sup> Vehicle data source: [https://www.ford.com.au/content/dam/ecom/Release-3/AU/F-150/FORDVF0512\\_F-150\\_Brochure\\_5Feb.pdf](https://www.ford.com.au/content/dam/ecom/Release-3/AU/F-150/FORDVF0512_F-150_Brochure_5Feb.pdf), accessed 8 April 2024

<sup>12</sup> Vehicle data source: <https://www.ford.com/trucks/super-duty/models/f250-xl/>, accessed 8 April 2024, units converted to metric by DITRDCA.

<sup>13</sup> <https://www.carsguide.com.au/ford/ranger/wheel-size>

<sup>14</sup> <https://www.drive.com.au/reviews/2023-ford-f-150-review/>

<sup>15</sup> <https://www.ford.com/trucks/super-duty/models/f250-xl/>

<sup>16</sup> Length measured with rear bumper fitted without tow receiver, width measured with exterior mirrors extended, Ranger height measured to top of antenna base, F-150 height measured to top of cab.



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	<b>Ford Ranger<sup>10</sup></b>	<b>Ford F-150<sup>11</sup></b>	<b>Ford F-250<sup>12</sup></b>
Braked towing capacity	2,500kg to 3,500kg	4,500kg	6,395 to 10,432kg
US emissions standard	Light duty vehicle	Light duty vehicle	Medium duty vehicle
Australian emissions standard	In scope for New Vehicle Efficiency Standard	In scope for New Vehicle Efficiency Standard	Not in scope for the New Vehicle Efficiency Standard (GVM exceeds 4.5 tonnes)

### How are targets determined for US medium duty trucks?

The committee had inquired on how stringent the US medium duty standards were. These standards calculate the relevant target in a different way to the US light duty standard. The sales weighted average CO<sub>2</sub> targets for 2021 to 2026 (in grams per mile) for medium duty vehicles are calculated as follows under the US standards:

<b>Year</b>	<b>Spark-Ignition (petrol, LPG and natural gas)</b>	<b>Compression ignition (diesel)</b>
2021	$0.0429 \times (WF) + 331$	$0.0406 \times (WF) + 312$
2022	$0.0418 \times (WF) + 322$	$0.0395 \times (WF) + 304$
2023	$0.0408 \times (WF) + 314$	$0.0386 \times (WF) + 297$
2024	$0.0398 \times (WF) + 306$	$0.0376 \times (WF) + 289$
2025	$0.0388 \times (WF) + 299$	$0.0367 \times (WF) + 282$
2026	$0.0378 \times (WF) + 291$	$0.0357 \times (WF) + 275$

WF = work factor. The work factor for commercial vehicles over 8,500 pounds is determined by the following formula:

$$WF = 0.75 \times (\text{Gross Vehicle Weight Rating} - \text{Curb Weight} + \text{xwd}) + 0.25 \times (\text{Gross Combination Weight Rating} - \text{Gross Vehicle Weight Rating})$$

xwd = 500 pounds if the vehicle has four-wheel drive or all-wheel drive; for all other vehicles: xwd = 0 pounds.

By way of illustrative example, according to this formula, the notional CO<sub>2</sub> target for a Ford F-250 4x4 diesel with a curb weight of 7331 lb, a gross vehicle weight rating of 11,940 lb and a gross combination weight rating of 33,940 lb would be:  $WF = (0.75 \times (11,940 - 7,331 + 500) + 0.25 \times (33,940 - 11,940)) = 9331.75$ . Thus, the CO<sub>2</sub> target for 2024 for a Ford F-250 would be  $0.0376 \times 9331.75 + 289 = 639.9$  g/mile (around 400 grams per kilometre).