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EPA Proposes New Emissions

Rules for Light, Medium & Heavy-Duty Vehicles

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On Wednesday, April 12th, 2023, the Environmental Protection Agency released new proposed rules that could require electric vehicles to account for up to two-thirds of new cars sold in the US by 2032. These rules will affect Light Duty passenger cars (LDV), Light Duty trucks (LDT), Medium Duty trucks (MDV), and Heavy-Duty trucks (HDV). The proposed rules are included in 2 separate proposals, One for LDV & MDVs, and another for HDVs. The complete text of each can be found through the below links:

LDV & MDV



[Read](#)

HDV



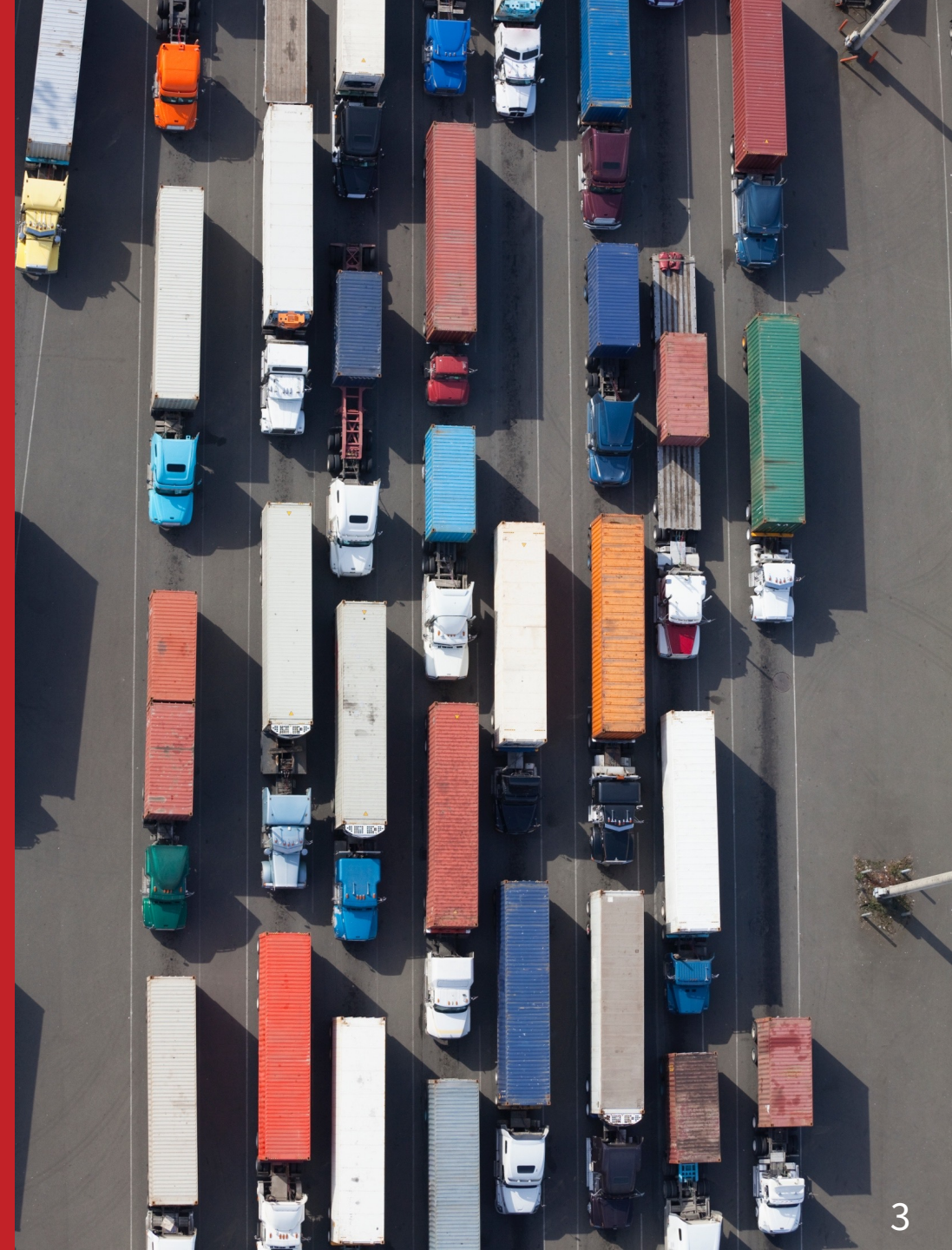
[Read](#)



The focus of this article is on light duty passenger cars and light duty trucks, although some info on medium duty trucks is included. Heavy duty trucks are not covered in this article, other than the above reference to the new proposed rule.

What is Affected

As stated above, these rules will revise emissions standards for all passenger cars, light duty trucks, medium duty trucks, and heavy-duty trucks. The new proposed rules aim to tighten standards beyond the current Tier 3 standards. Fleet average fuel economy requirements regulated through EPA's greenhouse gas (GHG) standards, are greatly reduced, as are other criteria pollutant standards for NMOG + NO_x, CO, Formaldehyde, & Particulate Matter (PM). In addition, several procedural changes and other requirements are included in the new proposed rules, affecting, test procedures, OBD, and various fleet calculations.





What is Not Affected

Not included in these rules are off road engines, stationary engines, motorhomes, or emergency vehicles.

When would these new proposed rules take effect

If approved, these rules would take effect in the 2027 MY, and progressively tighten requirements through the 2032 MY. Before these rules can be implemented, a public comment period will commence. In addition, there are alternative plans being considered.

2027-

2032

How will these changes affect the landscape of new vehicle sales?

Due to the extreme reduction in emissions required by these proposed rules, along with their singular focus on tailpipe emissions (emissions from fuel refinement and power generation are not considered), the predicted effect is a significant increase in the sale of electric vehicles. Projected electric vehicle sales as a percentage of total vehicle sales, by year, is shown here for both the current path, and the new path under the proposed rules:

	2027	2028	2029	2030	2031	2032
Sedans	45%	53%	61%	69%	73%	78%
Crossovers/ SUVs	38%	46%	56%	59%	61%	62%
Pickups	11%	23%	37%	45%	55%	68%
Total	36%	45%	55%	60%	63%	67%

Table 80. Fleet BEV penetration rates, by body style, under the proposed standards

	2027	2028	2029	2030	2031	2032
Sedans	39%	41%	45%	46%	44%	43%
Crossovers/ SUVs	26%	32%	37%	40%	39%	39%
Pickups	7%	16%	24%	29%	31%	33%
Total	27%	32%	37%	40%	40%	39%

Table 81. Fleet BEV penetration rates, by body style, under the No Action case

What are the major changes?

GHG

Under these new proposed rules, one of the most significant changes is the decrease in allowed fleet average fuel economy, regulated under EPA's GHG standard. Under these rules, light duty fleet average CO2 emissions (a direct correlation to fuel economy) would reduce from current 2026MY requirements and offer significantly less consideration for increased vehicle footprint.



As shown in the graphs below depicting current Tier 3 standards, followed by the new proposed standards, for both cars and trucks.

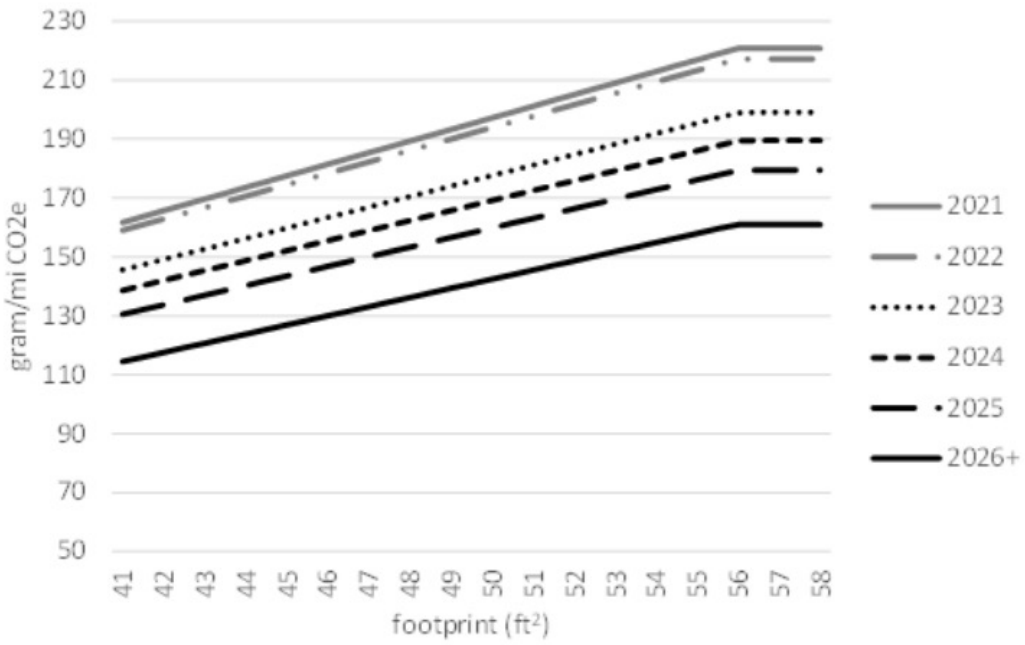


Figure 4. Car footprint curves for MYs 2021-2026

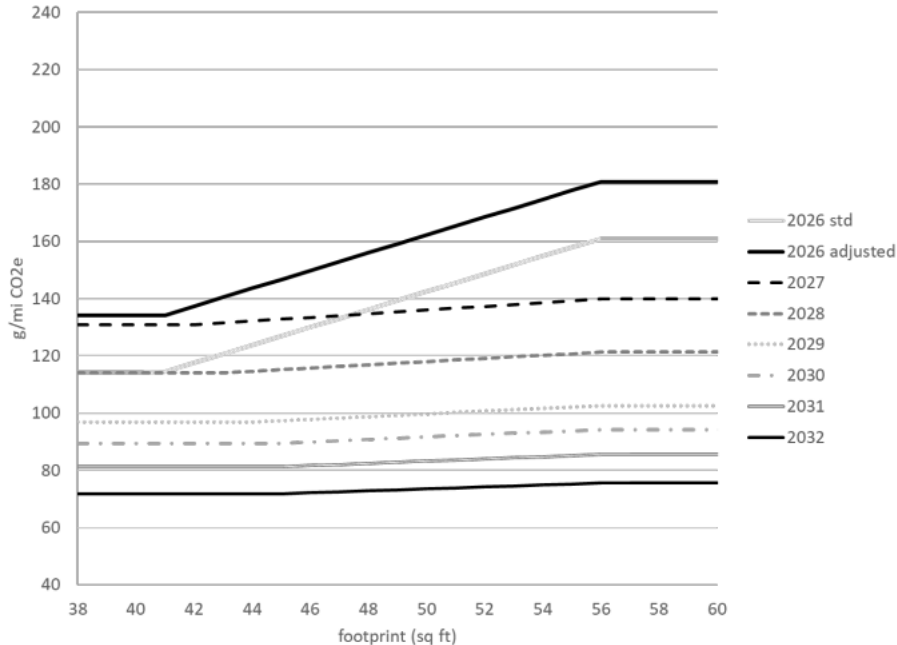


Figure 8. Proposed standards for cars, MY 2027-2032

In these tables, the MY 2026 targets have been adjusted to reflect differences in off-cycle and AC credits between the 2021 Rule and this proposal.

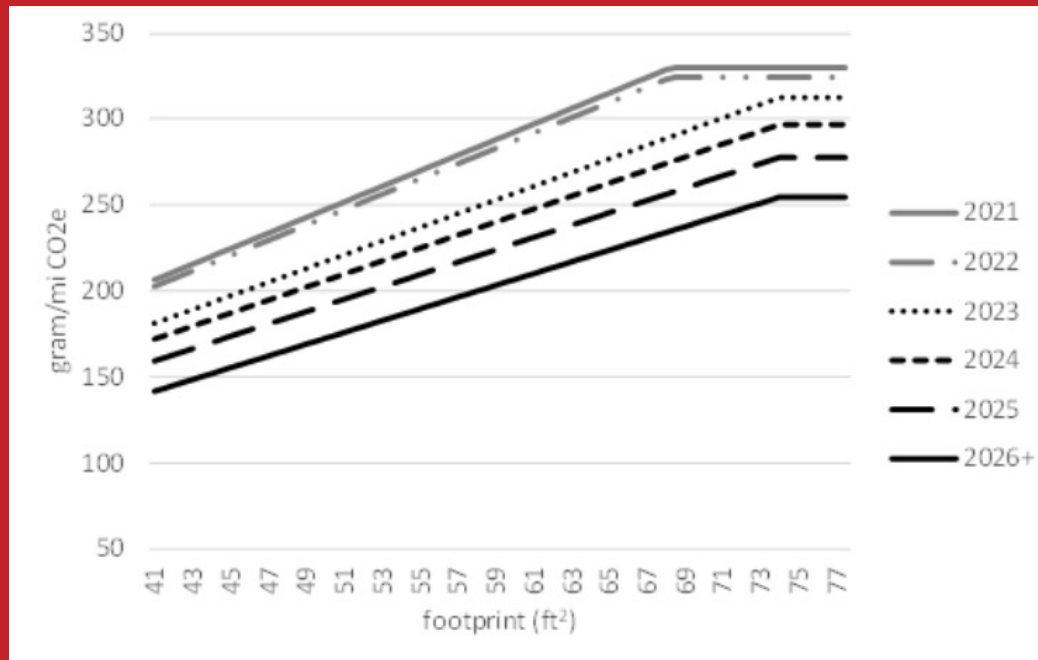


Figure 5. Truck footprint curves for MYs 2021-2026

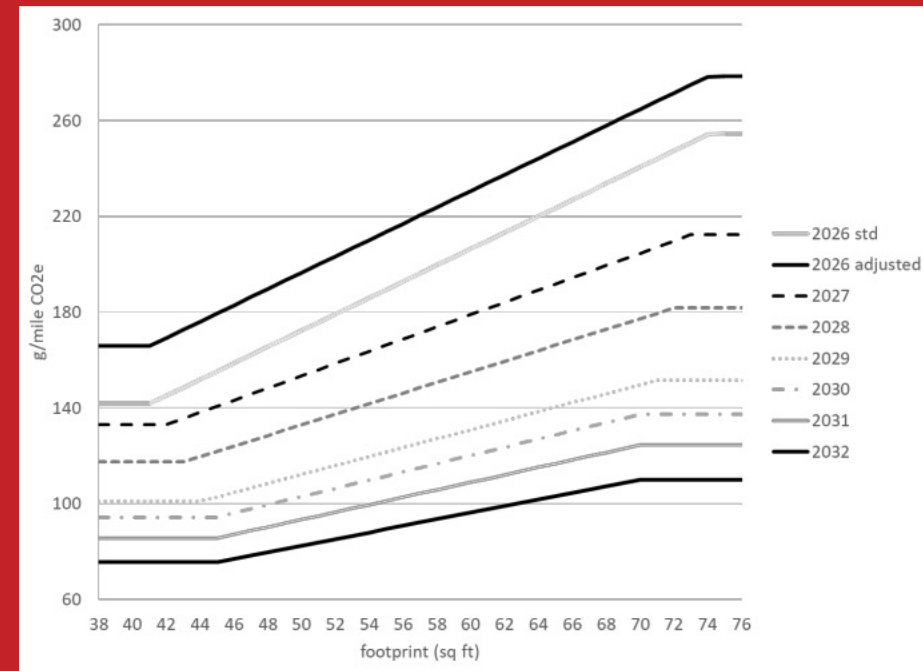


Figure 9. Proposed standards for trucks, MY 2027-2032

New standards

EPA is proposing more stringent standards for MYs 2027-2032 that are projected to result in an industry-wide average target for the light-duty fleet of **82 g/mile of CO2 in MY 2032**.

The 82 g/mile estimated industry-wide target for MY 2032 noted in the previous paragraph is based on EPA's current fleet mix projections for MY 2032 (approximately 40 percent cars and 60 percent trucks, assuming only slight variations from MY 2026).

The projected average annual decrease in combined industry average targets from the current standards in MY 2026 to the new standards in MY 2032 is **12.8 percent per year**. Compared to past rulemakings the annual percentage reductions are significantly higher

Model Year	Cars CO2 (g/mile)	Trucks CO2(g/mile)	Fleet CO2 (g/mile)
2026 Adjusted	152	207	186
2027	134	163	152
2028	116	142	131
2029	99	120	111
2030	91	110	102
2031	82	100	93
2032 and later	73	89	82

Table 29. Estimated fleet-wide CO2 targets corresponding to the proposed standards 408, 409

Criteria pollutants

Criteria pollutant standards are also tightened in these proposed rules. The Tier 3 BIN classifications remain the same (shown below) however the fleet average requirements are significantly reduced. Specifically in the case of NMOG + NO_x.

	NMOG + NO _x	PM	CO	HCHO
Bin 160	160	3	4.2	4
Bin 125	125	3	2.1	4
Bin 70	70	3	1.7	4
Bin 50	50	3	1.7	4
Bin 30	30	3	1.0	4
Bin 20	20	3	1.0	4
Bin 0	0	0	0	0

Table 22. Tier 3 FTP standards for LDVs and MDPVs (mg/mile)



Current Standard

	2017	2018	2019	2020	2021	2022	2023	2024	2025+
Passenger cars and small trucks	86	79	72	65	58	51	44	37	30
Large light trucks and MDPVs	101	93	83	74	65	56	47	38	30

Table 23. Tier 3 NM0G + NOx fleet average FTP standards for light-duty vehicles and MDPVs (mg/mile)

Proposed Standard

	2026	2027	2028	2029	2030	2031	2032+
LDV, LDT1 & LDT 2 NMOG + NOx (mg/mile)	30*	22	20	18	16	14	12
LDT3, LDT4 & MDPV NMOG + NOx (mg/mile)	30*	30*	30*	30*	12	12	12
MDV NMOG = NOx Class 2b NMOG + NOx (mg/mile)	178*	178*	178*	178*	60	60	60
MDV NMOG = Nox Class 3 NMOG + NOx (mg/mile)	247*	247*	247*	247*	60	60	60

Table 41. LDV, LDT, MDPV and MDV fleet average NMOG + NOx standards under the default compliance

PM Standards

The PM standards that EPA is proposing would require vehicle manufacturers to produce vehicles that emit PM at GPF-equipped (Gasoline Particulate Filter) levels (GPF-level PM). The proposed rule does not require that GPF hardware be used on vehicles, but rather reflects EPA's judgement that it is feasible and appropriate to achieve the proposed PM standards considering the availability of this technology. It is expected that GPF technology will be the most practical and cost-effective pathway for meeting the standard, especially in -7°C FTP and US06 test cycles. The following are the current and proposed standards.

Test Cycle	Tier 3 Standards (mg/mi)	Proposed PM Standard (mg/mi)
25°C FTP	3	0.5
US06	6	0.5
-7°C FTP	NA	0.5

Table 46. Proposed light-duty vehicle PM standards

Test Cycle	Tier 3 Standards (mg/mi)	Proposed PM Standard (mg/mi)
25°C FTP	8/10 for 2b/3 vehicles	0.5
US06	10/7 for 2b/3 vehicle on SFTP	0.5
-7°C FTP	NA	0.5

Table 47. Proposed MDV (Class 2b and 3) at or below 22,000lb GCWR PM standards

CO and HCHO Standards for Light-Duty Vehicles

EPA is proposing CO and formaldehyde (HCHO) emissions caps for light-duty vehicles shown in Table 48. The proposed value of the CO emissions cap for the 25°C FTP, HFET, US06, SC03 test cycles, 1.7 g/mi, is the same as the Tier 3 bin-specific standards for Bin 50 and Bin 70, but it must be met across four cycles instead of the Tier 3 cycles of 25°C FTP and a separate standard for the SFTP.

CO cap for 25°C FTP, HFET, US06, SC03 (g/mi)	HCHO cap for 25°C FTP (mg/mi)	CO cap for -7°C FTP (g/mi)
1.7	4	10.0

Table 48. Light-duty vehicle CO and HCHO emissions caps



Test Fuel



The new proposed rule requires a change from Tier 2 test fuel or Indolene, to Tier 3 test fuel.

Rule will solidify the elimination of the previous phase in for “well to wheel” emissions consideration

In the 2012 rule, for MYs 2022–2025, EPA allowed manufacturers to use a 0 g/mi compliance value (i.e., a value reflecting tailpipe emissions only) for the electric-only portion of operation of BEVs/PHEVs/FCEVs up to a per-company cumulative production cap.⁴⁶⁸ As originally envisioned in the 2012 rule, starting with MY 2022, the compliance value for BEVs, FCEVs, and the electric portion of PHEVs in excess of individual automaker cumulative production caps would be based on net upstream emissions accounting (i.e., EPA would attribute a pro rata share of national CO₂ emissions from electricity generation to each mile driven under electric power minus a pro rata share of upstream emissions associated with from gasoline production). The 2012 rule would have required net upstream emissions accounting for all MY 2022 and later electrified vehicles. However, in the 2020 rule, prior to upstream accounting taking effect, EPA revised its regulations to extend

the use of 0 g/mile compliance value through MY 2026 with no production cap, effectively continuing the practice of basing compliance only on tailpipe emissions for all vehicle and fuel types. EPA is proposing to make the current treatment of PEVs and FCEVs through MY 2026 permanent. EPA proposes to include only emissions measured directly from the vehicle in the vehicle GHG program for MYs 2027 and later (or until EPA changes the regulations through future rulemaking)

This is significant because it solidifies the practice of counting only the emissions from the tailpipe without consideration of the full environmental effect of how the energy is produced. This further tips the scales toward electric vehicle technology, and away from clean fuels, and other clean ICE technologies.

PHEV contribution factor changed (more emissions from gas)

EPA is proposing to revise the light-duty vehicle PHEV Fleet Utility Factor curve used in CO2 compliance calculation for PHEVs, beginning in MY 2027. The agency believes the current light-duty vehicle PHEV compliance methodology significantly underestimates PHEV CO2 emissions. Essentially, the new rule would increase the percent duty cycle PHEVs are expected to operate under power of the IC engine.

Phase out of Small Volume Manufacturers (SVM) (less than 5000 vehicles) allowed to request alternative GHG standards

Currently, SVMs are allowed to request alternate GHG standards to reflect the fact that they often produce only one type of vehicle, often performance or luxury vehicles, making it more difficult to achieve the fleet average requirements. EPA received applications for SVM alternative standards for MYs 2017-2021 from four manufacturers: Aston Martin, Ferrari, Lotus, and McLaren. Under the proposed rule, the ability to request these alternate standards would be phased out per the following schedule:

Model year	2025	2026	2027	2028	2029	2030	2031	2032+
Primary program standards that apply	2023	2023	2025	2025	2027	2028	2030	2032
Years of additional lead time	2	3	2	3	2	2	1	0

Table 38. Proposed additional lead time for SVM standards under the primary program



OBD Monitoring

Since GPF technology is expected to be an important enabler for meeting the proposed PM standard, OBD monitoring of the GPF system is necessary. If a vehicle uses a GPF, the OBD system must detect GPF-related malfunctions, store trouble codes related to detected malfunctions, and alert operators appropriately.

NMOG+NO_x Provisions Aligned with CARB ACC II Program

EPA would require vehicle manufacturers to attest to meeting the three specific CARB ACC II program standards using CARB-defined test procedures.

Elimination of Commanded Enrichment for Power or Component Protection:

EPA is proposing to eliminate the allowance of the use of commanded fuel enrichment as an AECD on SI engines used in light-duty vehicles and MDV for either power or component protection during normal operation and use.

Conclusions

As can be inferred from the above summary of the significant changes proposed in the new rules, EPA is intent on accelerating adoption of electric vehicles in the US market. The proposal goes on at length to explain the justification for their assessment in the industry's and infrastructure's preparedness to meet these lofty goals, as well as the predicted impact these proposed rules would have on climate change. Not appropriately considered in these rules is the environmental impact of EV production and electricity production, or the likelihood of consumer demand to match the production mix of EVs needed to meet these standards.

