

OTAQ Regulatory Update

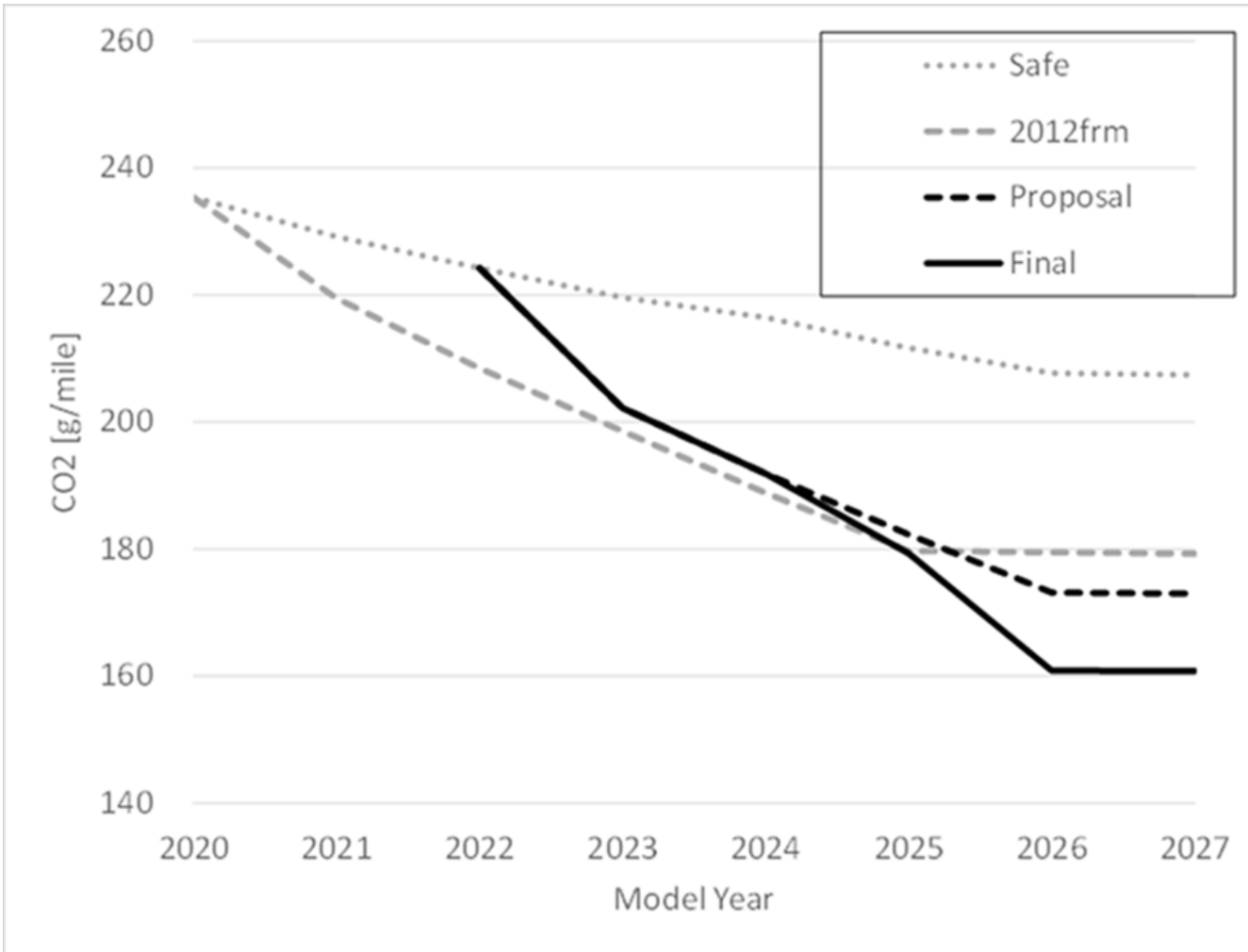
Overview Briefing for the MSTRS

MAY 25, 2022

Agenda

- Light-Duty Vehicle 2023 – 2026 Final Rule
- Highway Heavy-Duty Engines & Vehicles 2027+ Proposed Rule
- Next Phases of Light, Medium, and Heavy-Duty Highway Rules
- Aircraft
 - PM, lead, and ICAO
- Renewable Fuels

Light-Duty Vehicle GHG Standards for 2023-2026



- Final Rule published December 30, 2021
- <https://www.govinfo.gov/content/pkg/FR-2021-12-30/pdf/2021-27854.pdf>
- Most stringent LDV GHG standards (to date)
- More than 3 billion tons avoided GHG emissions through 2050
- Strong launch point for 2027+ transition of fleet toward zero emissions

Industry Fleet-wide Projections

CO₂ Compliance Targets (grams/mile)

Model Year	Cars	Light Trucks	Fleet
2023	166	234	202
2024	158	222	192
2025	149	207	179
2026	132	187	161

Year-Over-Year Percent Reductions (Combined Car/Truck Fleet)

Model Year	Previous Standards (SAFE)	Dec. 2022 Final Rule
2023	2.1%	9.8%
2024	1.4%	5.1%
2025	2.2%	6.6%
2026	1.9%	10%

Projected Electric Vehicle Penetration (BEVs + PHEVs)

- EPA's rule projects that compliance with the Model Year 2026 standards can be achieved with about 17% EVs industry-wide

	2023 EVs	2026 EVs
No-Action Case	5%	7%
Final Standards	7%	17%

Large Positive Net Benefits

- Net benefits of \$190 billion: improved public health, reduced climate impacts, consumer fuel savings
- From a consumer perspective, over the lifetime of a MY 2026 vehicle, the reduction in fuel costs will outweigh the increase in vehicle costs by about **\$1,080**

	3% Discount Rate	7% Discount Rate
Costs	\$300	\$180
Fuel Savings	\$320	\$150
Benefits	\$170	\$150
Net Benefits	\$190	\$120

Optional Auto Manufacturer Flexibilities

- EPA rule includes several optional flexibilities that automakers can choose to utilize in transitioning to the revised standards

	2023	2024	2025	2026
Credit Life Extension	✓	✓		
Advanced Technology Multipliers (PHEV, EV, FCV - with cap on use)	✓	✓		
Full-size Pickup Truck Incentives (for strong HEVs or performance level well below target)	✓	✓		
Off-cycle Menu Cap Increase	✓	✓	✓	✓

Highway Heavy-Duty 2027 Rulemaking

Categories of Highway Vehicles

Heavy-Duty Engines & Vehicles

Light-Duty Vehicles



Medium-Duty Vehicles



This proposed action's primary focus is on **heavy-duty vehicles and the engines/powertrains** which drive them

EPA's Clean Truck Plan: A Road Map to a Zero Emission Future

Federal Register	Presidential Documents
Vol. 86, No. 151	
Tuesday, August 10, 2021	
Title 3—	Executive Order 14037 of August 5, 2021
The President	Strengthening American Leadership in Clean Cars and Trucks

EPA is developing multiple heavy-duty rules under our Clean Truck Plan, consistent with EO 14037:

- 1) This proposal to set more stringent NOx standards for **heavy-duty engines & vehicles** beginning in model year (MY) 2027 and tightening the “Phase 2” greenhouse gas (GHG) emissions for MY 2027 and beyond.
- 2) An upcoming proposal to set more stringent emissions standards for **medium-duty vehicles** for MY 2027 and later. These revised standards will be proposed in combination with new standards for **light-duty vehicles** for MY 2027 and beyond.
- 3) An upcoming proposal to set “Phase 3” GHG standards for **heavy-duty vehicles** beginning as soon as MY 2030 that are significantly stronger than the MY 2027 GHG standards.

Key Heavy-Duty Program Elements to Reduce Emissions

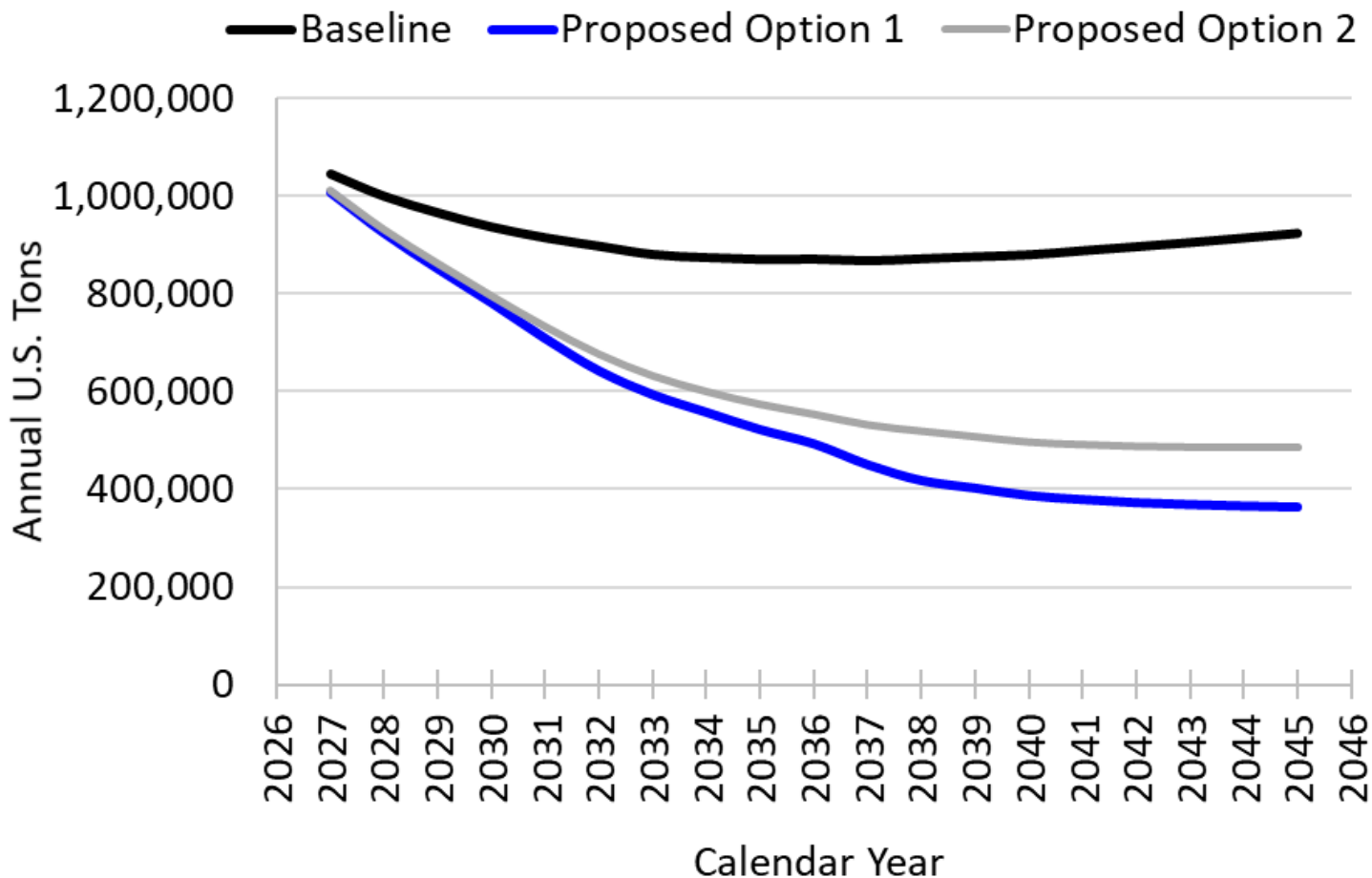
- Proposal issued in Federal Register on March 28, 2022
 - Comment period closed on May 16, 2022
- The proposal includes changes to 4 key program elements
 - **Test Procedures** – new and revised
 - **Regulatory Useful Life** - lengthened
 - **Numeric Emission Standards** - lower
 - **Emissions Warranty** - lengthened

Overview of Proposed NOx requirements

- EPA presents two regulatory options for new NOx standards:
 - Both would change key provisions of the heavy-duty emission control program
 - **Proposed Option 1**: starts in MY 2027 with final step in MY 2031 that provides up to 90% reduction in NOx standard over the city and highway cycles*
 - **Proposed Option 2**: starts in MY 2027 with no phase-in; provides 75% reduction in NOx standard over the city and highway cycles
 - Request comment on both regulatory options and the range in between them, as well as a more stringent Alternative presented but not analyzed

*level of reduction varies by useful life period and engine regulatory class

Heavy-Duty Highway NO_x Emissions Inventory: Baseline versus Proposed Options 1 and 2



	NO _x Reduction (%)	
	CY 2036	CY 2045
Proposed Option 1	43%	61%
Proposed Option 2	37%	47%

Environmental Justice Analysis

- The most significant impacts of this rule would be reducing the impacts of HD trucks on regional ozone and PM_{2.5}
- In the 2045 baseline (i.e., without the rule), areas with the worst ozone and PM_{2.5} are disproportionately minority
- The biggest air quality improvements from the rule would occur in these areas
- We have also conducted a detailed analysis of the populations living near major truck routes
 - About 72 million people live within 200 meters of a truck route
 - More likely to be people of color and have lower incomes

Background: HD GHG Program Highlights

- Standards set by heavy-duty regulatory categories, e.g., tractors, vocational vehicles, large pickups/vans
- Phase 1 vehicle standards implemented 2014 through 2018; Phase 2 program started in MY 2021, fully phase in by MY 2027

**Combination
Tractors**



Vocational Vehicles



Large Pickups & Vans



When designing program in 2016, EPA envisioned these technologies *could* be used to meet Phase 2:

- Engine, transmission, and driveline improvements
- Extended and workday idle reduction technologies
- Aerodynamic devices
- Lower rolling resistance tires
- Automatic tire inflation systems
- Weight reduction
- Engine stop start
- Powertrain hybridization
- Combustion optimization
- Improved air handling
- Reduced friction within the engine
- Improved emissions after-treatment technologies
- Engine waste heat recovery

Proposed Increase in Stringency of GHG Phase 2 MY 2027 Standards in Consideration of the Evolving EV Market

- Projected EV production levels in HD market based on known and projected EV product offerings – four major vehicle types shown on the right
- Proposed adjusting the Phase 2 GHG emission standards by sales-weighting the projected EV production levels of the four vehicle types and increasing the stringency of the MY 2027 standards
- Specifically - we propose to increase the stringency of the MY 2027 standards for 17 vehicle categories to capture the projected the market penetration of ZEVs in these vehicle categories
 - Request comment on the potential for progressively more stringent CO₂ standards across model years 2027, 2028 and 2029

Vocational: School Buses

(e.g., Thomas Built Saf-T-Liner Jouley, Blue Bird--3 models--Vision, All American, and Micro Bird)



Vocational: Urban Buses

(e.g., Proterra ZX5, Gillig Battery Electric)



Vocational: Local Delivery Trucks

(e.g., Peterbilt 220EV, Freightliner eM2)



Tractors: Regional Haul Tractors

(e.g., Volvo VNR Electric, Freightliner eCascadia, Peterbilt 579EV, Kenworth T680E)



Heavy-Duty 2027 Proposal - Public participation

- EPA provided several opportunities for public input into this rulemaking
- January 2020 – published an ANPRM
- April 2022 - held 3 days of public hearing
- Formal public comment period (ended May 16)
- Goal is to issue final rule by December 2022
 - To provide Clean Air Act 4-year lead-time to enable new NOx standards to begin in Model Year 2027

EPA's Longer-term Light, Medium, and Heavy-Duty Actions

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EPA's New Rulemakings for longer-term Light, Medium, and Heavy Duty Vehicles

Light-duty + Medium-duty vehicles

- Multipollutant: GHGs + criteria pollutants
- Consider significant opportunity provided by ZEVs
- Address at least MYs 2027 - 2030
- Timing
 - Proposed rule: March 2023
 - Final rule: March 2024

Heavy-duty vehicles

- Build upon the GHG Phase 2 standard
- Consider significant opportunity provided by ZEVs
 - Consider revisions for MYs 2030+
- Timing
 - Proposed rule: May 2023
 - Final rule: May 2024

- EPA looks forward to robust engagement with all stakeholders to gather input to inform both rulemakings

Aircraft

- Aircraft engine PM standards
 - Feb. 2022 - EPA proposed to adopt the international PM limits agreed to by ICAO
 - Currently working on the development of the final rule
- Lead emissions from piston-engine aircraft
 - EPA plans to issue a proposed determination regarding whether emissions of lead from piston-engine aircraft endanger public health or welfare this year, with an opportunity for notice and comment.
 - EPA will finalize any determination in 2023
- International Civil Aviation Organization
 - February 2022 meeting of the Committee for Aviation Environmental Protection, set the work agenda for the next 3 years
 - A decision was made to undertake the development of more stringent aircraft CO₂ standards, as well as undertake technical work which could be used to support a future effort for new engine NO_x and PM standards

Renewable Fuels

- RFS Volume Rules: 2020 – 2022
- RFS “Set” Rulemaking
- eRINs
- E15