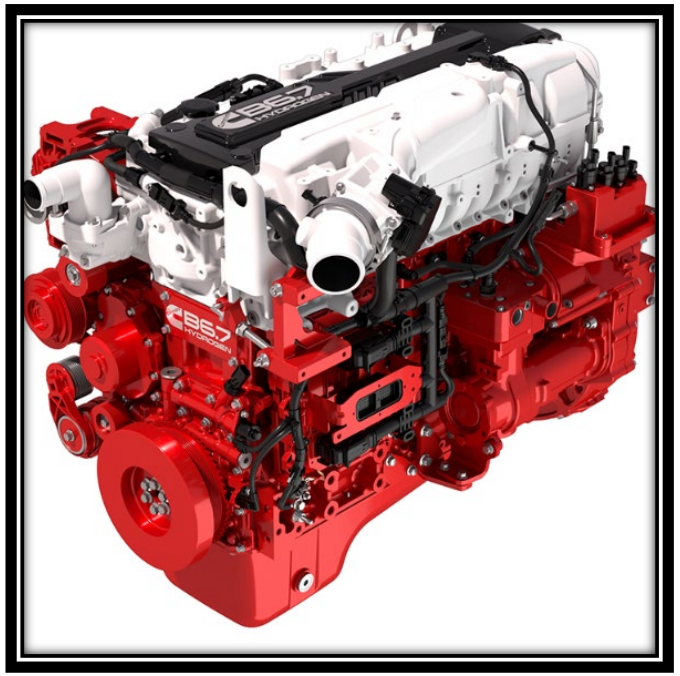
CUMMINS

A BUSINESS PARTNER YOU CAN ALWAYS COUNT ON

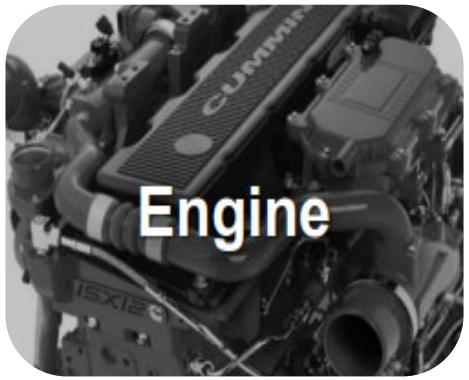
Cummins was founded on February 3rd, 1919, by Clessie Cummins and W.G. Irwin, who believed in the power of ideas and had a shared vision of what ingenuity and hard work could achieve.

Jennifer Rumsey currently serving as President and Chief Operating Officer, will be the seventh CEO and first woman to lead the company since it was founded in 1919.



2050 Destination Zero **spending more than $1 billion per year on research and developing future power technologies on the way to net-zero emissions by 2050.**

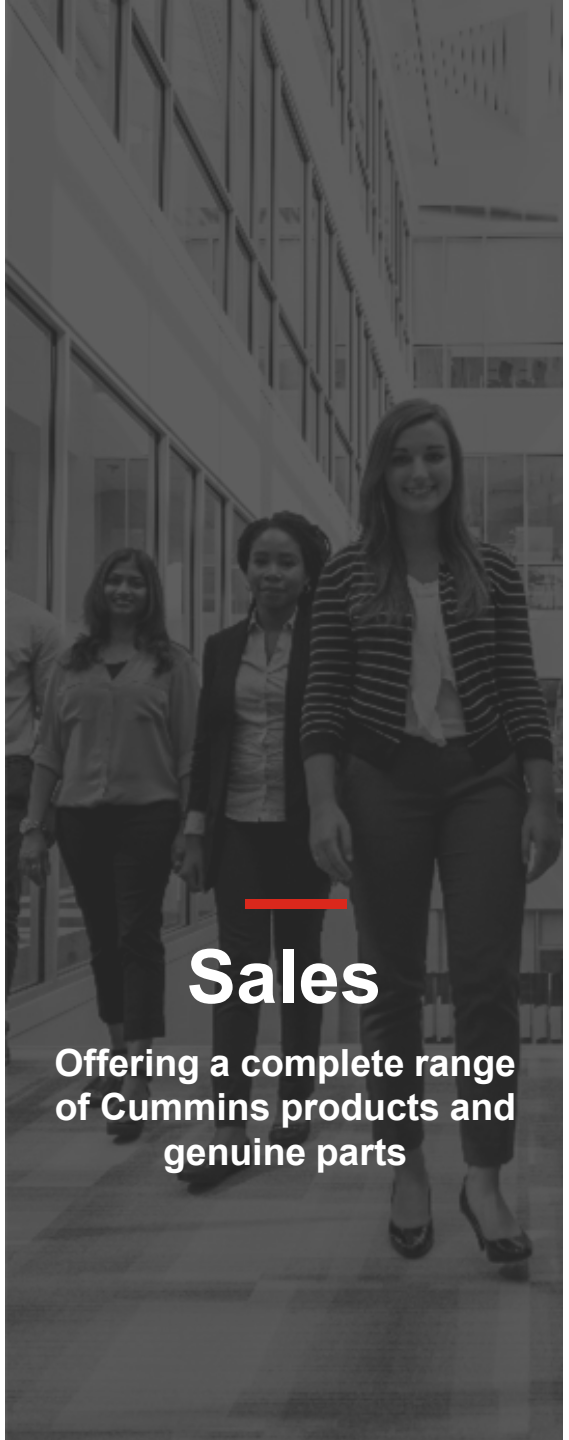
Five operating segments



- Cummins has a 100-year-long track record of delivering leading power solutions. As we look ahead, we know our industries and markets will continue to change, and we are committed to bringing our customers the right technology at the right time.
- Today, Cummins serves customers in more than 190 countries through a network of 500+ distributors and 7,500+ dealer locations.

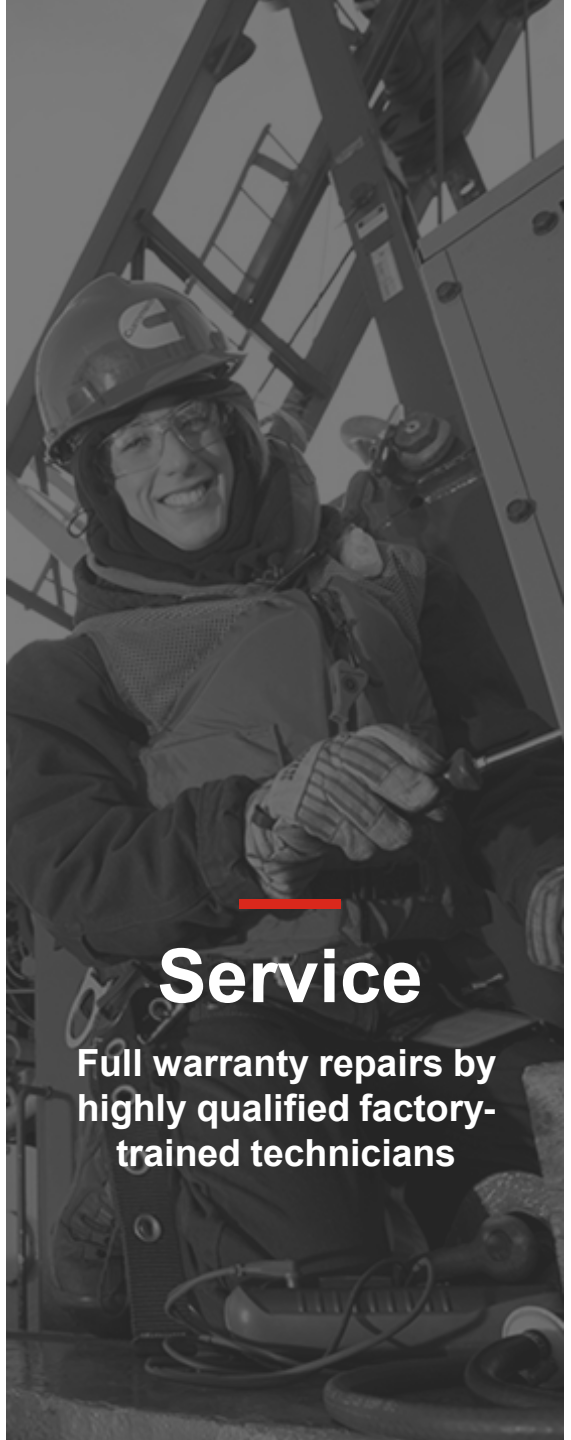
About the Distribution Business

We focus on selling and servicing engines and power generation equipment, providing application engineering support, and promoting the sale of genuine aftermarket parts.



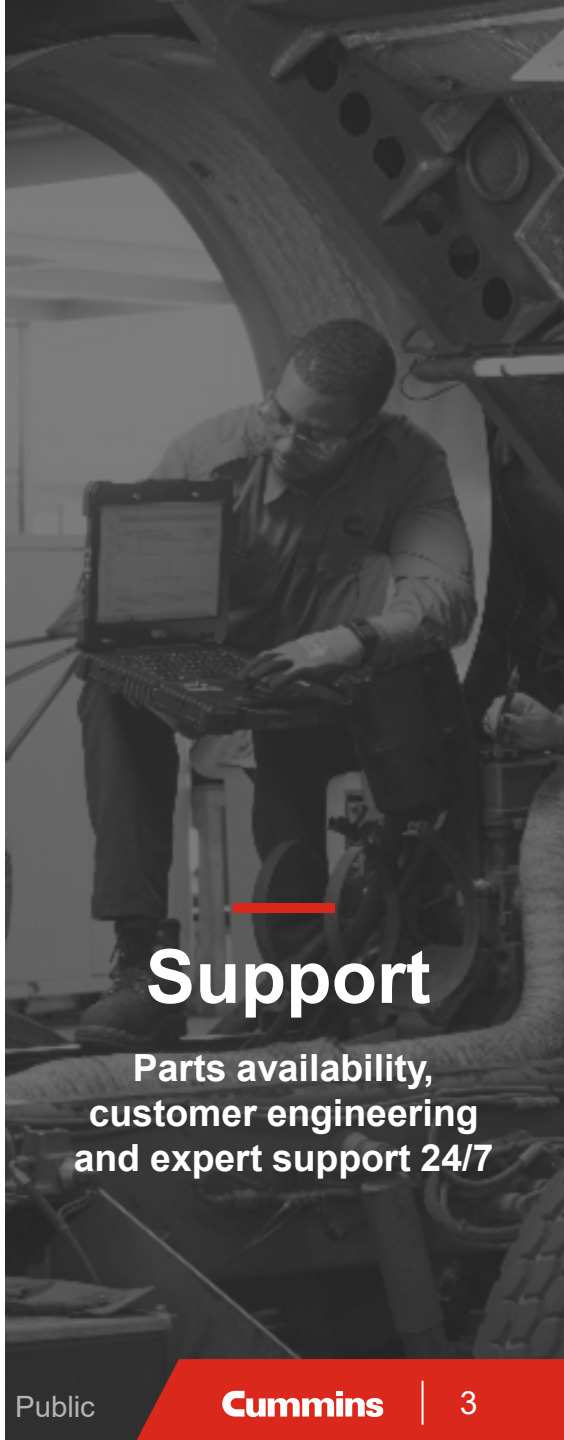
Sales

Offering a complete range of Cummins products and genuine parts



Service

Full warranty repairs by highly qualified factory-trained technicians

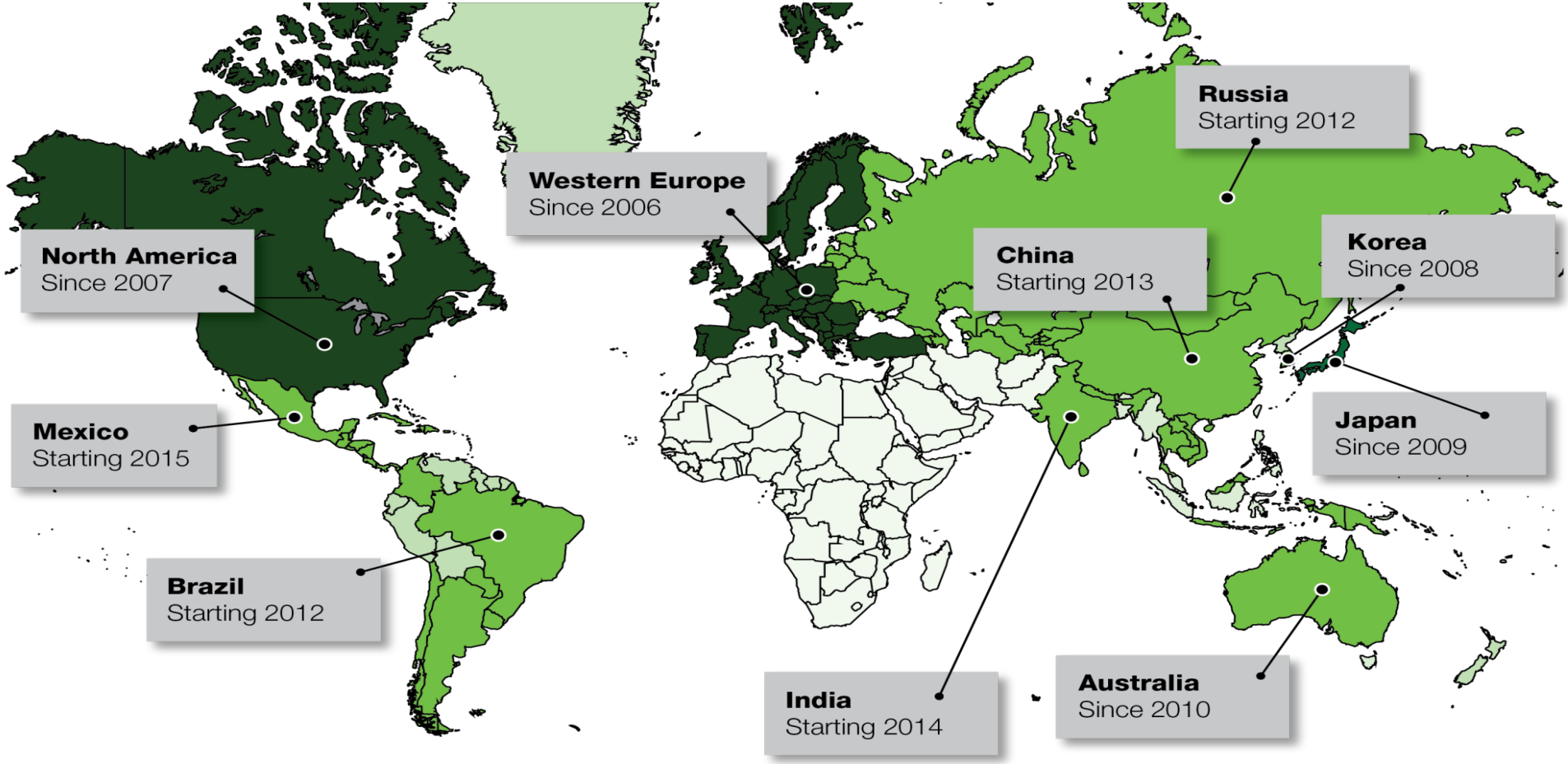


Support

Parts availability, customer engineering and expert support 24/7

US Greenhouse Gas Regulations for On-Highway HD Engines

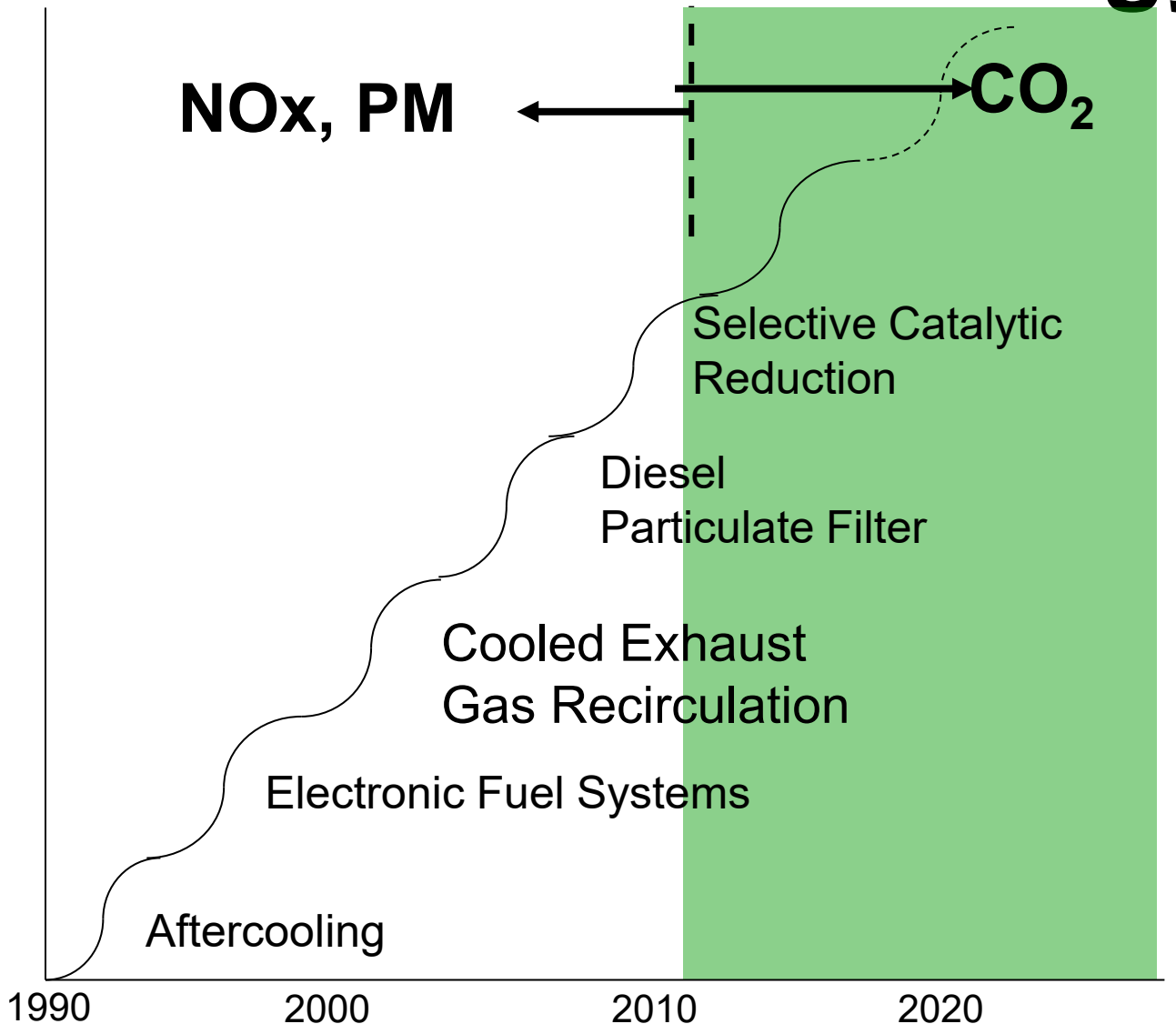
Global Emissions



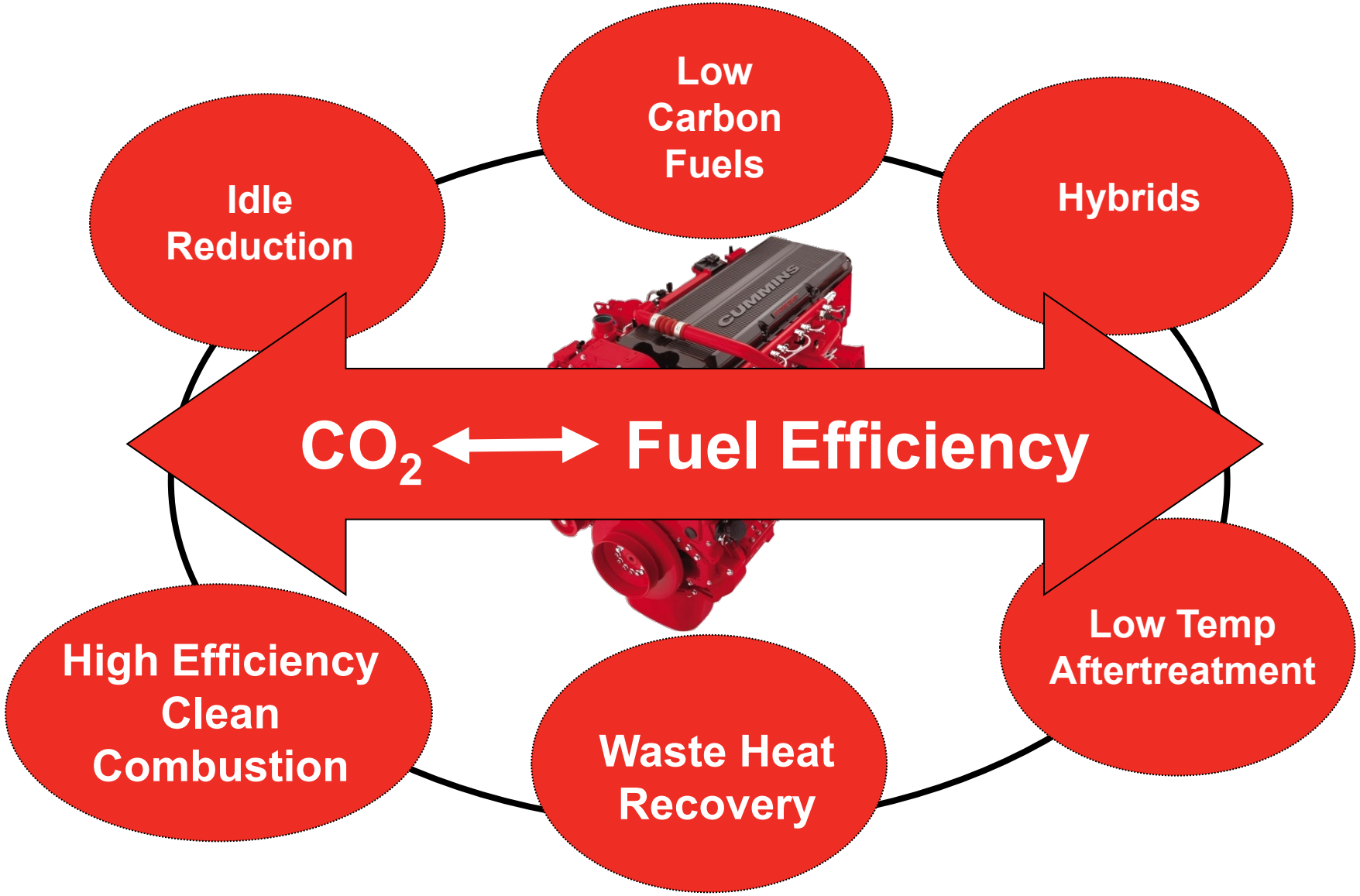
Emission Regulations

- 1988 Ignition Timing – Step Timing Control
- 1991 Full Authority Electronic Controls
- 1994 Re-entrant Piston Combustion Bowl
- 1998 Advanced Elect. & Combustion Tech.
- 2002 Exhaust Gas Recirculation (EGR)
- 2007 Exhaust Aftertreatment (DPF)
- **2010 Selective Catalytic Reduction**
- 2013 OBD On-board Emission Diagnostics
- 2014 Green House Gas GHG
- 2017 Green House Gas GHG

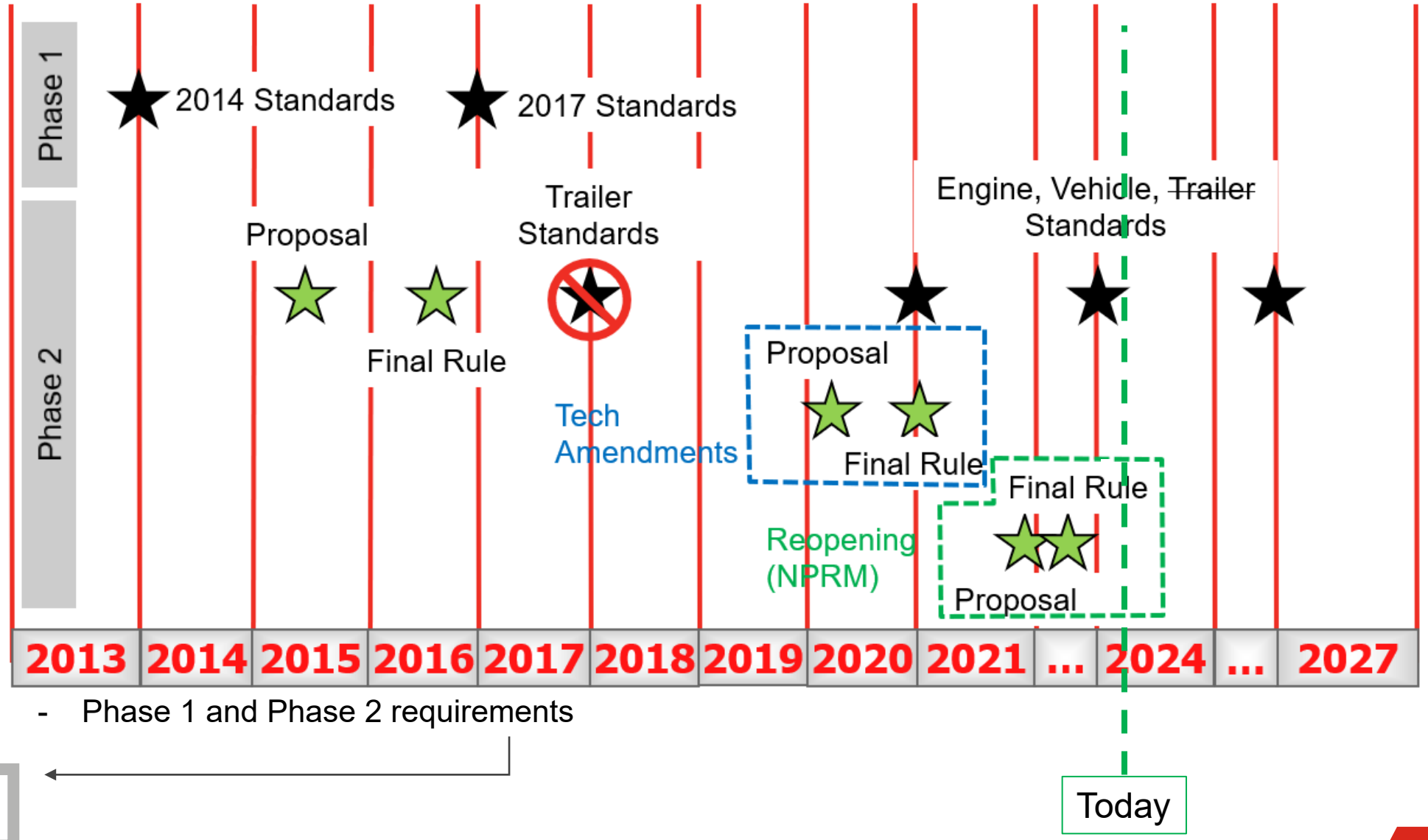
Evolution of Diesel Technology



Reducing CO_2



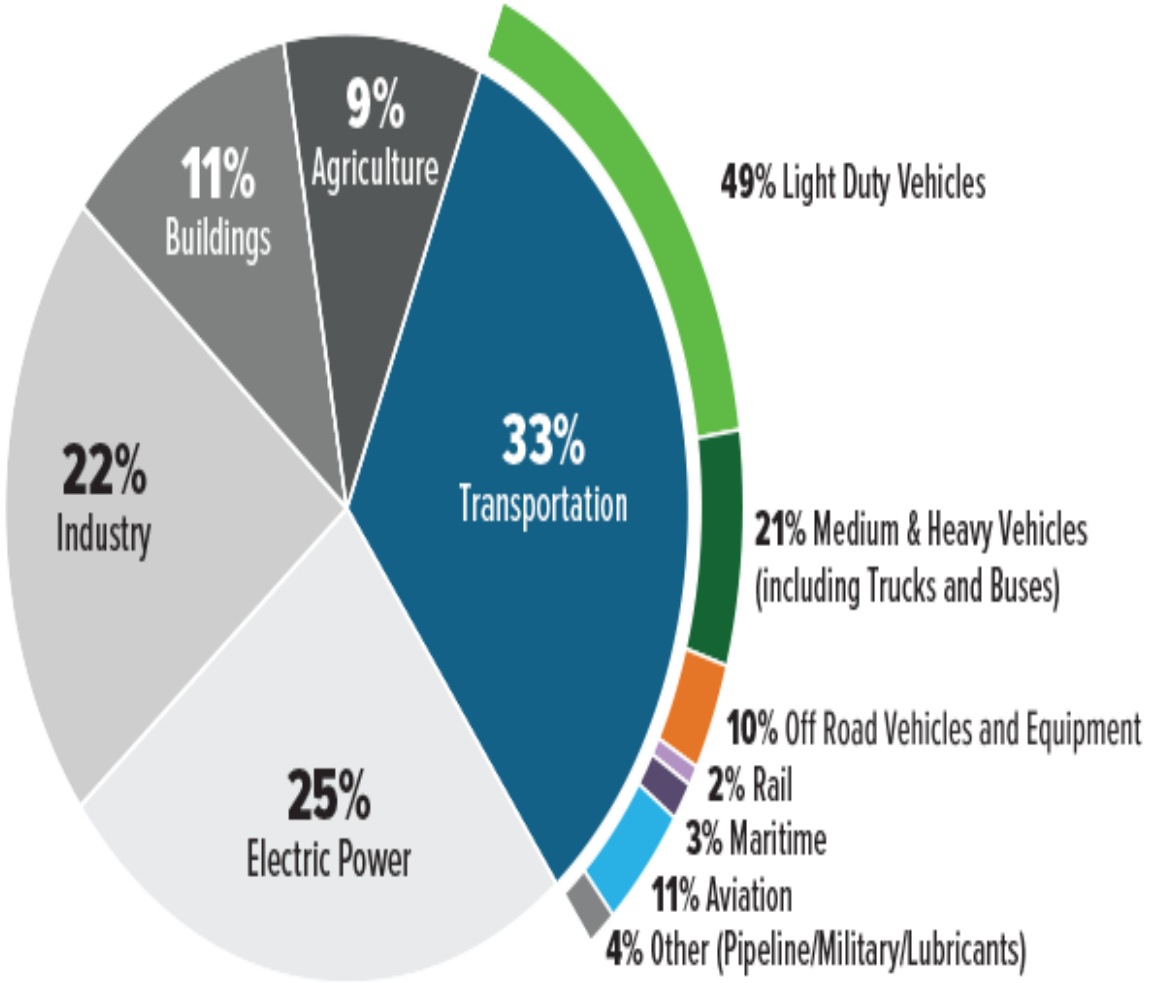
U.S. On Highway GHG Regulatory Timeline



- Phase 1 and Phase 2 requirements

Phase 1 Phase 2

2019 U.S. GHG EMISSIONS



https://www.epa.gov/greenvehicles/why-we-need-decarbonize-transportation

Transportation Mode	Share of Current Transportation Emissions	Federal GHG Emissions Reduction Goals
Light-Duty Vehicles	49%	• Achieve 50% of new vehicle sales being zero-emission by 2030 supporting a pathway for full adoption, and ensure that new internal combustion engine vehicles are as efficient as possible • Deploy 500,000 EV chargers by 2030 REF • Ensure 100% federal fleet procurement be zero-emission by 2027 REF
Medium and Heavy-Duty Trucks and Buses	21%	• Aim to have 30% of new vehicle sales be zero-emission by 2030 and 100% by 2040 REF • Ensure 100% federal fleet procurement is zero-emission by 2035 REF
Off-road	10%	• Work to establish specific targets • Focus resources to develop technology pathways and set efficiency and zero-emissions vehicle and equipment targets
Rail	2%	• Work to establish specific targets • Focus resources to develop technology pathways and set efficiency and zero-emissions vehicle targets • Encourage greater use for passenger and freight travel to reduce emissions from road vehicles
Maritime	3%	• Continue to support the Zero-Emission Shipping Mission (ZESM) goals to ensure that 5% of the global deep-sea fleet are capable of using zero-emission fuels by 2030, at least 200 of these ships primarily use these fuels across the main deep sea shipping route, and 10 large trade ports covering at least three continents can supply zero-emission fuels by 2030 REF • Support the U.S. domestic maritime sector by performing more RD&D into sustainable fuels and technologies and incentivize U.S. commercial vessel operators to move towards lower GHG emissions • Work with countries in the International Maritime Organization to adopt a goal of achieving zero emissions from international shipping by 2050 REF
Aviation	11%	• Reduce aviation emissions by 20% by 2030 when compared to a business-as-usual scenario • Achieve net-zero GHG emissions from the U.S. aviation sector by 2050 • Catalyze the production of at least three billion gallons of SAF per year by 2030 and ~35 billion gallons by 2050, enough to supply the entire sector REF

https://www.energy.gov/sites/default/files/2023-01/the-us-national-blueprint-for-transportation-decarbonization.pdf

EPA 2021-2027 Emissions Regulations

- Phase 2 - Green House Gas Reduction (Phase 1 began 2014 Truck Builds)
- 2021-2027 Model Year for Medium and Heavy-duty Trucks
- Begin Jan. 1, 2021; interim standards in MY 2024
- Reduce Impact of Climate Change
- Improve Fuel Efficiency = Reduced Costs
- The fully phased-in standards will achieve up to 25% lower CO_2 emissions and fuel consumption compared to the Phase 1 standards and will reduce CO_2 pollution by approximately 1.1 billion metric tons.

Emissions Simplified

Regulatory Landscape

CRITERIA AIR EMISSIONS

- Particulate matter (PM) and other emissions like nitrogen oxides **(NOx)**
- Contribute to smog and negative public health outcomes
- Close to zero with today's technologies, but NOx can be lowered further

GREENHOUSE GASES (GHG)

- Carbon dioxide (CO_2), methane, nitrous oxide, and others
- Trapped heat contributes to climate change
- Constraints in what can be achieved with fossil fuels
- For most of our applications, no well-to-wheels zero carbon solutions exist today

Zero Emissions

Regulatory Landscape

Emissions Acronyms

ACF	Advanced Clean Fleet
ACT	Advanced Clean Truck
BEV	Battery Electric Vehicle
CARB	California Air Resources Board
CI	Clean Idle
CO2	Carbon Dioxide
EMA	Truck and Engine Manufacturers Association
EPA	Environmental Protection Agency
ESG	Environment, Social, Governance
EUL	Emission Useful Life
FCEV	Fuel Cell Electric Vehicle
GHG	Greenhouse Gases
ICE	Internal Combustion Engine (Include Diesel, Natural Gas, Hydrogen)
MAW	Moving Average Window
MOU	Memorandum of Understanding (State signed agreement to adopt CARB regulations)
NOx	Oxides of Nitrogen
NZEV	Near Zero Emissions Vehicle (Plug-in hybrid electric vehicle)
PM	Particulate Matter
ZEB	Zero Emissions Bus
ZEV	Zero Emissions Vehicle (Includes BEV and FCEV)

EPA / CARB Emission Regulation Timeline

Regulatory Landscape

	2022	2024	2027	2030	2031
EPA	**EPA 200 mg NOx** 185k mi EUL (MHD) 435k mi EUL (HHD) 100k mi Warranty	**EPA 200 mg NOx** 185k mi EUL (MHD) 435k mi EUL (HHD) 100k mi Warranty	**EPA 35 mg NOx** 350k mi EUL (MHD) 750k mi EUL (650k In-Use) 280k mi Warranty (MD) 450k mi Warranty (HHD)	**EPA 35mg NOx** 350k mi EUL (MHD) 750k mi EUL (HHD) (650k In-Use) 280k mi Warranty (MD) 450k mi Warranty (HHD)	
CARB	**CARB 200 mg NOx** 185k EUL (MHD) 435k mi EUL (HHD) 150k mi Warranty (MD) 350k mi Warranty (HHD)	**CARB 50 mg NOx** 185k mi EUL (MHD) 435k mi EUL (HHD) 150k mi Warranty MD 350k mi Warranty (HHD)	**CARB 35 mg NOx** 350k mi EUL (MHD) 750k mi EUL (650k In-Use) 280k mi Warranty (MHD) 450k mi Warranty (HHD)	**CARB 35 mg NOx** 350k mi EUL (MHD) 800k mi EUL (HHD) 280k mi Warranty (MHD) 600k mi Warranty (HHD)	

2026 EPA 50 mg NOx “Pull ahead” provision

CARB-EMA Deal: Legacy Provision

CARB-EMA Deal: CARB will align with EPA starting in 2027 and provide 4 years lead time and 3 years stability before next regulation

CARB ACT ZEV Sales & ACF ZEV Purchase Mandates

CARB ACF ZEV Purchase Mandate

CARB and EPA Highlights

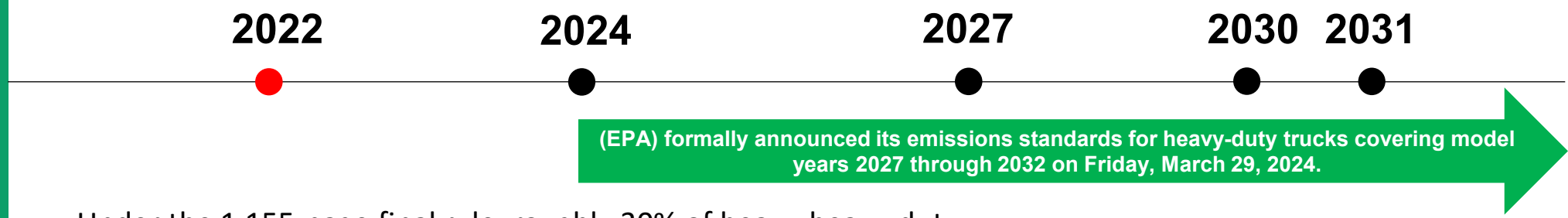
CARB and EMA Agreement

Who do these regulations impact?

CARB and EPA Highlights

Agency	Rule	Start	Status	Regulated Party	Requirements
CARB	Omnibus Low NOx	2024	Final (EPA waiver pending for emission standards)	Engine manufacturers	50 mg NOx, 5 mg PM in 2024; 35 mg NOx in 2027 More stringent Clean Idle, in-use testing, warranty, useful life, etc.
	Advanced Clean Trucks (ACT)	2024	Final	Vehicle manufacturers	ZEV sales requirements starting in 2024
	Advanced Clean Fleets (ACF)	2024	Final (April 28, 2023)	Owners/fleets	ZEV purchase requirements starting in 2024
	Heavy Duty Inspection & Maintenance (Clean Truck Check)	2023	Final	Owners/fleets	Demonstrate functioning emissions control system to maintain DMV registration; register and report into HD I/M database, includes option for reporting via telematics for vehicles with OBD
	Innovative Clean Transit (ICT)	2019	Final	Public Transit Agencies	ZEB purchase requirements starting in 2023 Fleets must be 100% ZE by 2040
	Zero Emission Airport Shuttle	2019	Final	Airport Shuttles	ZEV purchase requirements starting in 2027 Fleets must be 100% ZEV by 2035
EPA	HD Low NOx	2027	Final (Dec. 20, 2022)	Engine manufacturers	35 mg NOx, 5 mg PM in 2027 Also changes to certification, in-use testing, credits, warranty, useful life, etc.
	GHG Phase 3	2027 / 2030	Proposal April 12, 2023	Vehicle manufacturers	More stringent vehicle CO_2 standards Increase ZEV adoption

EPA / CARB Emission Regulation Timeline



Under the 1,155-page final rule, roughly 30% of heavy-heavy-duty vocational trucks would need to be zero-emission by 2032 and 40% of regional day cabs.

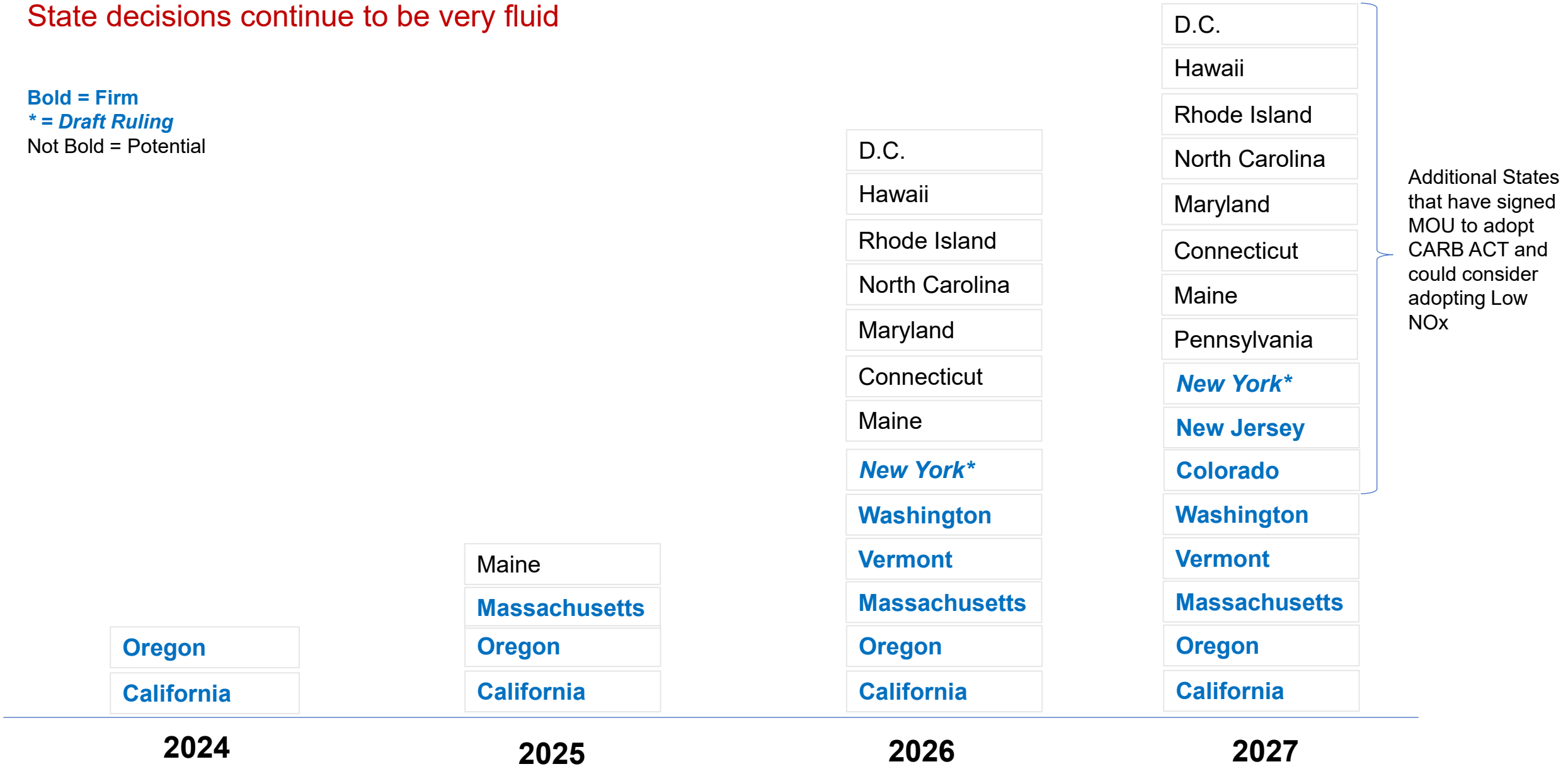
Phase 3 sets stronger standards to reduce greenhouse gas emissions from heavy-duty (HD) vehicles beginning in model year (MY) 2027. The new standards will be applicable to HD vocational vehicles (such as delivery trucks, refuse haulers, public utility trucks, transit, shuttle, school buses, etc.) and tractors (such as day cabs and sleeper cabs on tractor-trailer trucks).

The EPA Phase 3 rule does not specify any one specific emissions solution in its rules, maintaining its promise of a "technology-neutral" approach.

CARB Omnibus Opt-In States Market

State decisions continue to be very fluid

Bold = Firm
**** = Draft Ruling***
Not Bold = Potential



https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/states-have-adopted-californias-vehicle-regulations

EPA GHG Phase 3

The US Environmental Protection Agency (EPA) announced final GHG emission standards for heavy-duty vehicles, such as freight trucks and buses. The *Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles – Phase 3* standards phase in over model years 2027 through 2032.

Percent Reduction from Phase 2 CO_2 Emission Standards

Vehicle Category	2027	2028	2029	2030	2031	2032
Light-Heavy Vocational	17%	22%	27%	32%	46%	60%
Medium-Heavy Vocational	13%	16%	19%	22%	31%	40%
Heavy-Heavy Vocational	-	-	13%	15%	23%	30%
Day Cab Tractors	-	8%	12%	16%	28%	40%
Sleeper Cab Tractor	-	-	-	6%	12%	25%

[Final Rule: Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles – Phase 3 | US EPA]

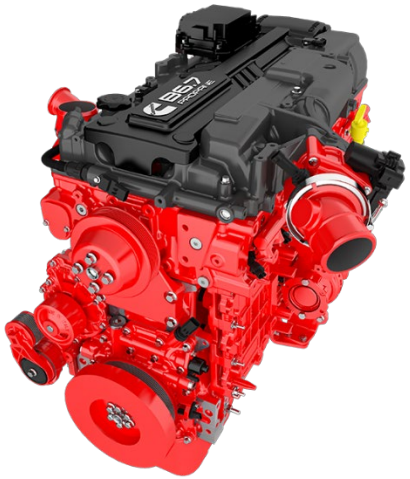
B Platform North America Product Plan

EPA & CARB Certified

EPA Only Certified

CARB Legacy Provision

No Change to Plan



EPA/CARB 0.2g NOx

EPA 0.2g NOx

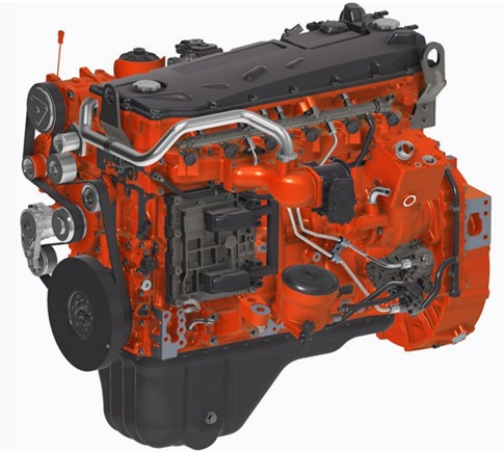
EPA 0.035g NOx

CARB 0.05g NOx

CARB 0.02g NOx

2022	2023	2024	2025	2026	2027	2028	2029
B6.7 Diesel EPA21/CARB21		B6.7 Diesel – EPA24 *CARB Volume Limited ('24-'25)*			X		
B6.7N Natural Gas		B6.7N Natural Gas – EPA only			X		

Next Gen B



2022	2023	2024	2025	2026	2027	2028	2029
					B7.2 Diesel – EPA27		
			B6.7 Octane				
			B6.7 Propane				

L Platform Product Plan – North America

EPA & CARB Certified

EPA Only Certified

CARB Legacy Provision

New Plan

EPA/CARB 0.2g NOx

EPA 0.2g NOx

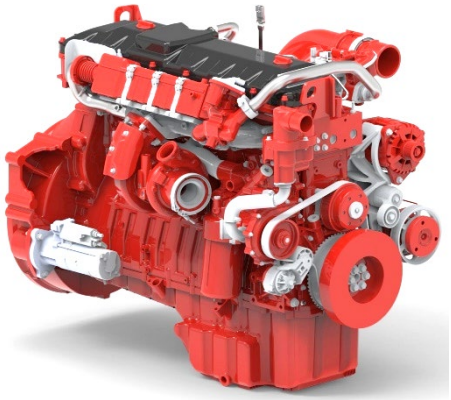
EPA 0.035g NOx

CARB 0.05g NOx

CARB 0.02g NOx

2022	2023	2024	2025	2026	2027	2028	2029
L9 Diesel EPA21/CARB21		L9 Diesel - EPA24 *CARB Volume Limited*		X			
L9N Natural Gas					X		

Next Gen X10



2022	2023	2024	2025	2026	2027	2028	2029
				10L Diesel EPA27/CARB24	10L Diesel – EPA27		
					10L Diesel – CARB27 (TBD '23)		
					10Liter – Natural Gas		

X Platform Product Plan – North America

EPA & CARB Certified

EPA Only Certified

CARB Legacy Provision

New Plan

EPA/CARB 0.2g NOx

EPA 0.2g NOx

EPA 0.035g NOx

CARB 0.05g NOx

CARB 0.02g NOx

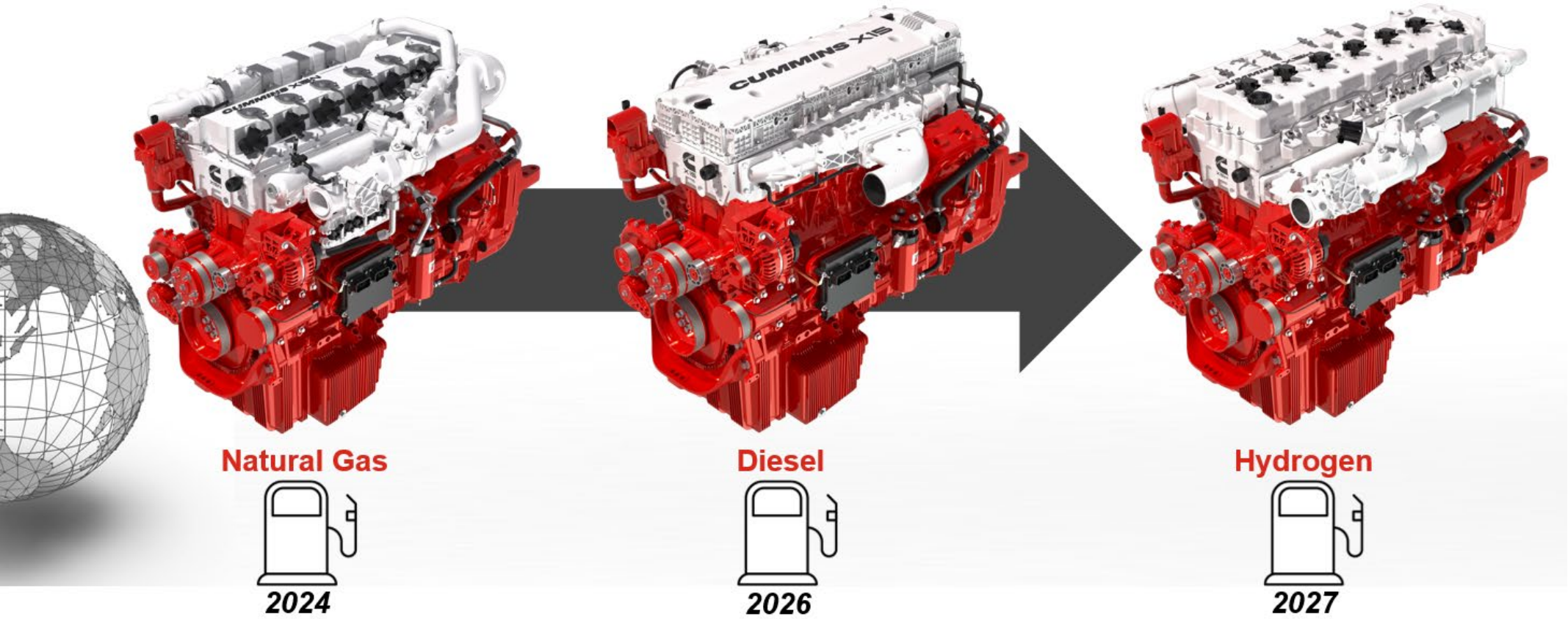
2022	2023	2024	2025	2026	2027	2028	2029
X15 Diesel EPA21/CARB21		X15 Diesel *CARB Volume Limited*		X			
X12 Diesel EPA21/CARB21		X12 Diesel *CARB Volume Limited*		X			
ISX12N Natural Gas		ISX12N Natural Gas – EPA Only			X		

Next Gen X15

2022	2023	2024	2025	2026	2027	2028	2029
		X15N – Natural Gas					
				X15 Diesel EPA27/CARB24	X15 Diesel – EPA27		
					X15 Diesel – CARB27 (TBD '23)		
					X15H – H2 ICE		

Global Platform: Cummins HELM™

Reliable | Durable | Scale | Common



Cummins HELM™ platforms “fuel agnostic” - higher efficiency, lower emissions, and multiple fuels

https://www.cummins.com/news/releases/2024/02/29/cummins-announces-innovative-next-generation-x15-diesel-engine-part

Program Estimated Timing

Service Readiness Preview

Finalized product information and timeline

Tools list available and training availability

Q1 2022 | Q2 | Q3 | Q4 | Q1 2023 | Q2 | Q3 | Q4 | Q1 2024 | Q2

2021

Engine Field Test

Limited Production

Start of Production 2024

*X15N Availability subject to OEM announcement

KEY TAKEAWAYS

EPA's Phase 3 emission regulations for 2027 and beyond announced March 29, 2024

“Phase 3” standards build on EPA’s Heavy-Duty Phase 2 program from 2016

The Phase 3 standards are *technology-neutral and performance-based*, allowing each manufacturer to choose what set of emissions control technologies is best suited to meet the standards and the needs of their customers

EPA’s 2024 rule fulfills the intent of the “Clean Trucks Plan”

Cummins supported EPA’s heavy-duty GHG Phase 1 and Phase 2 rules

Cummins supports the EPA Phase 3 final rule and is investing to deliver our next generation of decarbonization technologies

Cummins HELM platforms give customers control of how they navigate their own journeys as part of emissions regulations beyond 2027

Resources and References Industry News

https://www.epa.gov/system/files/documents/2024-03/420f24018.pdf

https://ww2.arb.ca.gov/sites/default/files/classic/msprog/hdlownox/files/HD_NOx_Omnibus_Fact_Sheet.pdf

https://www.whitehouse.gov/wp-content/uploads/2021/10/US-Long-Term-Strategy.pdf

Cummins and Chevron collaborate to help customers lower carbon emissions | Cummins Inc.

California Regulations

https://ww2.arb.ca.gov/our-work/programs/advanced-clean-fleets

https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard

https://www.cummins.com/sites/default/files/2020-01/PLANET%202050_Strategy_1209.pdf

https://www.cummins.com/sites/default/files/2019-11/Planet%202050%20Fact%20Sheet.pdf

Industry

State of Sustainable Fleets Report 2022

CA Natural Gas Vehicle Partnership - https://cngvp.org/

NGVAmerica - https://ngvamerica.org/resource-center/

Clean Trucks Plan | US EPA

Final Rule: Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles – Phase 3 | US EPA

https://www.borgwarner.com/newsroom/press-releases/2024/02/07/borgwarner--cummins--eaton-and-ford-support-stronger-national-heavy-duty-pollution-standards

https://www.trucking.org/news-insights/trucking-industry-reacts-new-epa-emission-standard-heavy-duty-trucks

Video resources on: Cummins YouTube

SCAN THIS QR CODE FOR MORE INFORMATION ON REDUCING COMMERICAL TRANSPORTATION EMISSIONS

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