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Vehicle Fuel Economy and Greenhouse Gas Standards: Frequently Asked Questions

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Vehicle Fuel Economy and Greenhouse Gas Standards: Frequently Asked Questions

On January 20, 2021, President Joe Biden issued Executive Order 13990, “Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis,” which directs federal agencies to review regulations and other agency actions from the Trump Administration, including the rules that revised the Obama Administration’s vehicle fuel economy and greenhouse gas (GHG) emissions standards.

Currently, the federal standards that regulate fuel economy and GHG emissions from new passenger cars and light trucks include the Corporate Average Fuel Economy (CAFE) standards promulgated by the U.S. Department of Transportation’s National Highway Traffic Safety Administration (NHTSA) and the Light-Duty Vehicle GHG emissions standards promulgated by the U.S. Environmental Protection Agency (EPA). They are known collectively as the National Program. NHTSA derives its authorities for the standards from the Energy Policy and Conservation Act of 1975, as amended (49 U.S.C. §§32901-32919). EPA derives its authorities for the standards from the Clean Air Act, as amended (42 U.S.C. §§7401-7626).

Under the Obama Administration, EPA and NHTSA promulgated joint rulemakings affecting model year (MY) 2012-2016 passenger cars and light trucks on May 7, 2010 (Phase 1). The agencies promulgated a second phase of standards affecting MYs 2017-2025 on October 15, 2012. The Phase 1 and the Phase 2 standards were preceded by multiparty agreements under which auto manufacturers pledged to reduce GHG emissions from most new passenger cars, sport utility vehicles, vans, and pickup trucks by about 50% by 2025, compared to 2010.

As part of the Phase 2 rulemaking, EPA and NHTSA made a commitment to conduct a midterm evaluation for the latter half of the standards (i.e., MYs 2022-2025, for which EPA had finalized requirements and NHTSA, due to statutory limits, had proposed “augural” requirements). On November 30, 2016, the Obama Administration’s EPA released a proposed determination stating that the MY 2022-2025 standards remained appropriate and that a rulemaking to change them was not warranted. On January 12, 2017, EPA finalized the determination.

After President Trump took office, however, EPA and NHTSA reopened the midterm evaluation process. EPA released a revised final determination on April 2, 2018, stating that the MY 2022-2025 standards were “not appropriate and, therefore, should be revised,” and that key assumptions in the January 2017 final determination—including gasoline prices, technology costs, and consumer acceptance—“were optimistic or have significantly changed.” With this revision, EPA and NHTSA announced that they would initiate a new rulemaking.

The agencies promulgated revisions to the CAFE and vehicle GHG emissions standards in two parts. On September 27, 2019, the agencies finalized the Safer, Affordable, Fuel-Efficient (SAFE) Vehicles Rule, Part One: One National Program, wherein NHTSA asserted its statutory authority to set nationally applicable fuel economy standards and EPA withdrew its Clean Air Act (CAA) preemption waiver it granted California’s GHG and Zero Emission Vehicle programs in January 2013. The agencies finalized the second part of the SAFE Vehicles Rule on March 31, 2020. The new rule targets a 1.5% increase in fuel economy each year from MY 2021 to MY 2026, compared to an approximate 5% increase each year under the withdrawn Phase 2 standards.

Debate continues over the stringency, design, and purpose of the CAFE and vehicle GHG emissions standards. The debate is informed by analyses regarding (1) whether the Obama-era standards are technically and economically feasible; (2) the impact of the standards on GHG emissions targets and energy conservation; (3) whether the standards adequately address consumer choice, safety, and other vehicle policies, both domestic and international; and (4) whether the EPA and NHTSA reopening and rule revision actions were lawful.

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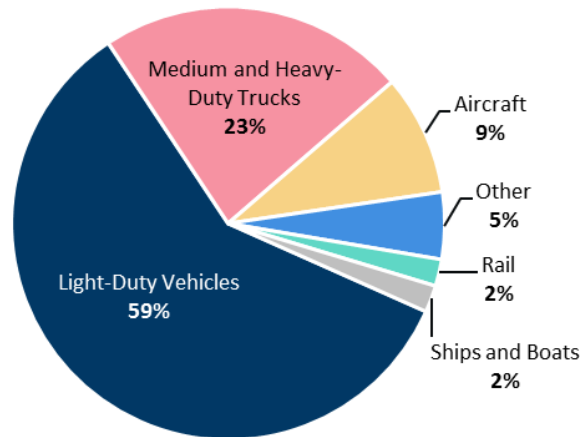
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This report addresses frequently asked questions about federal and state regulation of fuel economy and greenhouse gas (GHG) emissions from new light-duty vehicles. Light-duty vehicles—a category that includes passenger cars and most sports utility vehicles (SUVs), vans, and pickup trucks—accounted for nearly 60% of the transportation sector’s GHG emissions in 2018 (Figure 1).

Figure 1. Transportation Sector Greenhouse Gas Emissions by Source, 2018



Source: EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2018*, April 13, 2020.

Note: Transportation emissions do not include emissions from nontransportation mobile sources such as agricultural and construction equipment.

The regulations include the Corporate Average Fuel Economy (CAFE) standards promulgated by the U.S. Department of Transportation’s (DOT’s) National Highway Traffic Safety Administration (NHTSA), the Light-Duty Vehicle GHG Emissions standards promulgated by the U.S. Environmental Protection Agency (EPA), and California’s Advanced Clean Car program. The report chronicles the origins of the standards and reviews the past and present regulations. It also examines the relationship between the California and the federal vehicle programs.

What Is the Biden Administration’s Proposal Regarding Vehicle Fuel Economy and GHG Emissions Standards?

On January 20, 2021, President Joe Biden issued Executive Order 13990, “Protecting Public Health and the Environment and Restoring Science To Tackle the Climate Crisis,” announcing a national policy

to listen to the science; to improve public health and protect our environment; to ensure access to clean air and water; to limit exposure to dangerous chemicals and pesticides; to hold polluters accountable, including those who disproportionately harm communities of color and low-income communities; to reduce greenhouse gas emissions; to bolster resilience to the impacts of climate change; to restore and expand our national treasures

and monuments; and to prioritize both environmental justice and the creation of the well-paying union jobs necessary to deliver on these goals.¹

To implement this policy, the executive order directs federal agencies to review regulations and other agency actions from the Trump Administration.² Section 2 of the order directs an “Immediate Review of Agency Actions Taken Between January 20, 2017, and January 20, 2021” within the time frame specified, including “The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program,” 84 *Federal Register* 51310 (September 27, 2019), by April 2021; and “The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks,” 85 *Federal Register* 24174 (April 30, 2020), by July 2021.³

Pursuant to the executive order, NHTSA and EPA are scheduled to propose whether to suspend, revise, or rescind the Trump Administration’s vehicle standards by July 2021. In preview, President Biden’s presidential campaign platform had outlined a plan to address vehicle fuel economy and GHG emissions in “The Biden Plan to Build a Modern, Sustainable Infrastructure and an Equitable Clean Energy Future.” It stated that his Administration would

establish ambitious fuel economy standards that save consumers money and cut air pollution. Biden will negotiate fuel economy standards with workers and their unions, environmentalists, industry, and states that achieve new ambition by integrating the most recent advances in technology. This will accelerate the adoption of zero-emissions light- and medium duty vehicles, provide long-term certainty for workers and the industry, and save consumers money through avoided fuel costs. Paired with historic public investments and direct consumer rebates for American-made, American-sourced clean vehicles, these ambitious standards will position America to achieve a net-zero emissions future, and position American auto workers, manufacturers, and consumers to benefit from a clean energy revolution in transport.⁴

What Is NHTSA’s Authority to Regulate the Fuel Economy of Motor Vehicles?

NHTSA derives its authority to regulate the fuel economy of motor vehicles from the Energy Policy and Conservation Act of 1975 (EPCA; P.L. 94-163) as amended by the Energy Independence and Security Act of 2007 (EISA; P.L. 110-140).⁵

The origin of federal fuel economy standards dates to the mid-1970s. The oil embargo of 1973-1974 imposed by Arab members of the Organization of the Petroleum Exporting Countries (OPEC) and the subsequent tripling in the price of crude oil brought the fuel economy of U.S. automobiles into sharp focus. The fleet-wide fuel economy of new passenger cars had declined

¹ §1, Executive Order 13990 of January 20, 2021, “Protecting Public Health and the Environment and Restoring Science To Tackle the Climate Crisis,” 86 *Federal Register* 7037-7043, January 25, 2021.

² Executive Order 13990 of January 20, 2021, “Protecting Public Health and the Environment and Restoring Science To Tackle the Climate Crisis,” 86 *Federal Register* 7037-7043, January 25, 2021.

³ §2, Executive Order 13990 of January 20, 2021, “Protecting Public Health and the Environment and Restoring Science To Tackle the Climate Crisis,” 86 *Federal Register* 7037-7043, January 25, 2021.

⁴ Joe Biden, “The Biden Plan to Build a Modern, Sustainable Infrastructure and an Equitable Clean Energy Future,” <https://joebiden.com/clean-energy/>.

⁵ 49 U.S.C. §§32901-32919.

from 15.9 miles per gallon (mpg) in model year (MY) 1965 to 13.0 mpg in MY 1973.⁶ In an effort to reduce dependence on imported oil, EPCA established CAFE standards for passenger cars beginning in MY 1978 and for light trucks⁷ beginning in MY 1979. The standards required each auto manufacturer to meet a target for the sales-weighted fuel economy of its entire fleet of vehicles sold in the United States in each model year. Fuel economy—expressed in *miles per gallon* (mpg)—was defined as the average mileage traveled by a vehicle per gallon of gasoline or equivalent amount of other fuel.

EPCA required NHTSA to establish and amend the CAFE standards; promulgate regulations concerning procedures, definitions, and reports; and enforce the regulations. CAFE standards, and new-vehicle fuel economy, rose steadily through the late 1970s and early 1980s. After 1985, Congress did not revise the legislated standards for passenger cars, and they remained at 27.5 mpg until 2011. The light truck standards were increased to 20.7 mpg in 1996, where they remained until 2005.⁸

New-vehicle fuel economy began to rise again in the mid-2000s, due, in part, to a steady increase in gasoline prices that led many consumers to purchase smaller, more fuel-efficient vehicles. During the George W. Bush Administration, NHTSA promulgated two sets of standards in the mid-2000s affecting the MY 2005-2007 and MY 2008-2011 light truck fleets, increasing their average fuel economy to 24.0 mpg. Further, Congress enacted EISA in 2007, which, among other provisions, revisited the CAFE standards. EISA required NHTSA to increase combined passenger car and light truck fuel economy standards to at least 35 mpg by 2020,⁹ up from the combined actual passenger car and light truck average of 26.6 mpg in 2007. Along with requiring higher vehicle standards, EISA changed the structure of the program (in part due to concerns about safety and consumer choice).¹⁰

What Is EPA's Authority to Regulate GHG Emissions from Motor Vehicles?

EPA derives its authority to regulate GHG emissions from motor vehicles from the Clean Air Act, as amended (CAA; P.L. 91-604, as amended).¹¹

In 1998, during the Clinton Administration, EPA General Counsel Jonathan Cannon concluded in a memorandum to the agency's Administrator that GHGs were air pollutants within the CAA's definition of the term, and therefore could be regulated under the CAA.¹² Relying on the Cannon

⁶ NHTSA, "Historical Passenger Car Fleet Average Characteristics," <https://one.nhtsa.gov/cars/rules/CAFE/HistoricalCarFleet.htm>.

⁷ Light trucks include most passenger sport utility vehicles (SUVs), vans, and pickup trucks.

⁸ Provisions in the Department of Transportation's annual appropriations bills between FY1996 and FY2002 prohibited the agency from changing or studying CAFE standards. As reported by National Research Council, *Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards*, Washington, DC: National Academy Press, 2002, p. 1.

⁹ Thirty-five miles per gallon is a lower bound: the Administration is required to set standards at the "maximum feasible" fuel economy level for any model year.

¹⁰ See discussion of vehicle "footprint" in the report section entitled "What Were the Standards Under the Obama Administration?"

¹¹ 42 U.S.C. §§7401-7626. For a history of the CAA, see CRS Report RL30853, *Clean Air Act: A Summary of the Act and Its Major Requirements*, by Kate C. Shouse and Richard K. Lattanzio.

¹² Memorandum from Jonathan Z. Cannon, EPA General Counsel, to Carol M. Browner, EPA Administrator, "EPA's Authority to Regulate Pollutants Emitted by Electric Power Generation Sources," April 10, 1998, at

memorandum as well as the statute itself, a group of 19 organizations petitioned EPA on October 20, 1999, to regulate GHG emissions from new motor vehicles under CAA Section 202.¹³ That section directs the EPA Administrator to develop emissions standards for “any air pollutant” from new motor vehicles “which, in his judgment cause[s], or contribute[s] to air pollution which may reasonably be anticipated to endanger public health or welfare.”¹⁴ On August 28, 2003, the George W. Bush Administration’s EPA denied the petition¹⁵ because it determined that the CAA does not grant EPA authority to regulate carbon dioxide (CO₂) and other GHG emissions based on their climate change impacts.¹⁶ Massachusetts, 11 other states, and various other petitioners challenged EPA’s denial of the petition in a case that ultimately reached the Supreme Court.¹⁷

In April 2007, the Supreme Court held that EPA has the authority to regulate GHGs as “air pollutants” under the CAA.¹⁸ In the 5-4 decision, the Court determined that GHGs fit within the CAA’s “unambiguous” and “sweeping definition” of “air pollutant.”¹⁹ The Court’s majority concluded that EPA must, therefore, decide whether GHG emissions from new motor vehicles contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or provide a reasonable explanation why it cannot or will not make that decision.²⁰ If EPA were to make a finding of endangerment, according to the ruling, the CAA required the agency to establish standards for emissions of the pollutants.²¹

Following the Supreme Court’s decision, EPA did not respond in 2008 to the original petition or make a finding regarding endangerment. Its only formal action following the Court decision was to issue a detailed information request, called an Advance Notice of Proposed Rulemaking (ANPR), on July 30, 2008.²² The Obama Administration’s EPA, however, made review of the

<http://www.law.umaryland.edu/environment/casebook/documents/epaco2memo1.pdf>.

¹³ 42 U.S.C. §7521. The lead petitioner was the International Center for Technology Assessment (ICTA). The petition may be found at http://www.ciel.org/Publications/greenhouse_petition_EPA.pdf.

¹⁴ 42 U.S.C. §7521.

¹⁵ EPA, “Control of Emissions from New Highway Vehicles and Engines,” 68 *Federal Register* 52922, September 8, 2003. The agency argued that it lacked statutory authority to regulate GHGs: Congress “was well aware of the global climate change issue” when it last comprehensively amended the CAA in 1990, according to the agency, but “it declined to adopt a proposed amendment establishing binding emissions limitations.” *Massachusetts v. EPA*, 549 U.S. 497 (2007).

¹⁶ Memorandum from Robert E. Fabricant, Gen. Counsel, EPA, on EPA’s Authority to Impose Mandatory Controls to Address Global Climate Change Under the Clean Air Act, to Marianne L. Horinko, Acting Admin., EPA, August 28, 2003, <https://go.usa.gov/xQ4mU>.

¹⁷ The U.S. Court of Appeals for the District of Columbia Circuit (D.C. Circuit), in a split decision, rejected the suit. *See Massachusetts v. EPA*, 415 F.3d 50, 56, 59-60 (D.C.C. 2005) (Randolph, J., dissenting) (holding that EPA reasonably denied the petition based on scientific uncertainty and policy considerations).

¹⁸ *Massachusetts v. EPA*, 549 U.S. 497, 528-29 (2007).

¹⁹ *Massachusetts v. EPA*, 549 U.S. 497, 528-29 (2007). The majority held that “[t]he Clean Air Act’s sweeping definition of ‘air pollutant’ includes ‘any air pollution agent or combination of such agents, including any physical, chemical ... substance or matter which is emitted into or otherwise enters the ambient air....’ ... Carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons are without a doubt ‘physical [and] chemical ... substances[s] which [are] emitted into ... the ambient air.’ The statute is unambiguous.” *Ibid.*, pp. 528-29.

²⁰ *Massachusetts v. EPA*, 549 U.S. 497, 528-29, 533 (2007).

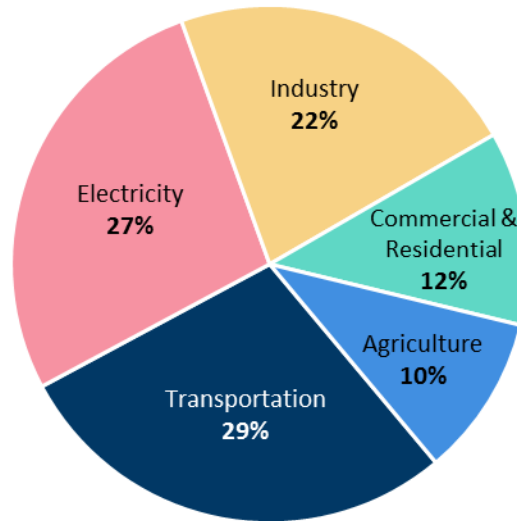
²¹ For further discussion of the Court’s decision, see CRS Report R44807, *U.S. Climate Change Regulation and Litigation: Selected Legal Issues*, by Linda Tsang.

²² EPA, “Regulating Greenhouse Gas Emissions under the Clean Air Act; Advance Notice of Proposed Rulemaking,” 73 *Federal Register* 44354, July 30, 2008. The ANPR occupied 167 pages of the *Federal Register*. Besides requesting information, it took the unusual approach of presenting statements from the Office of Management and Budget, four Cabinet Departments (Agriculture, Commerce, Transportation, and Energy), the Chairman of the Council on Environmental Quality, the Director of the President’s Office of Science and Technology Policy, the Chairman of the

endangerment issue a high priority. On December 15, 2009, it promulgated findings that GHGs endanger both public health and welfare, and that GHG emissions from new motor vehicles contribute to that endangerment.²³

With these findings, the Obama Administration initiated discussions with major stakeholders in the automotive and truck industries and with states and other interested parties to develop and implement vehicle GHG standards. Because CO₂ from fuel combustion in the transportation sector is the largest source of GHG emissions (**Figure 2**), the White House directed EPA to work with NHTSA to align the GHG standards with the CAFE standards.

Figure 2. U.S. Greenhouse Gas Emissions by Sector, 2018



Source: EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2018*, April 13, 2020.

Note: Total GHG emissions in 2018 equaled 6,677 million metric tons of carbon dioxide equivalent.

In addition, the CAA grants the state of California unique status to receive a waiver to issue motor vehicle emissions standards, provided that they are at least as stringent as federal ones and are necessary to meet “compelling and extraordinary conditions.” California had already promulgated GHG emissions standards prior to 2009, for which it had requested an EPA waiver under provisions in the CAA. EPA granted California a waiver in July 2009, and President Obama

Council of Economic Advisers, and the Chief Counsel for Advocacy at the Small Business Administration, each of whom expressed their objections to regulating GHG emissions under the CAA. The 2008 OMB statement began by noting, “The issues raised during interagency review are so significant that we have been unable to reach interagency consensus in a timely way, and as a result, this staff draft cannot be considered Administration policy or representative of the views of the Administration.” *73 Federal Register* 44356. It went on to state that “the Clean Air Act is a deeply flawed and unsuitable vehicle for reducing greenhouse gas emissions.” Other letters submitted to the regulatory docket concurred.

²³ EPA, “Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act; Final Rule,” *74 Federal Register* 66496, December 15, 2009. Although generally referred to as simply “the endangerment finding,” the EPA Administrator actually finalized two separate findings: a finding that six greenhouse gases endanger public health and welfare, and a separate “cause or contribute” finding that the combined emissions of greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution that endangers public health and welfare. Throughout the report, GHGs are quantified using a unit measurement called CO₂ equivalent (CO₂e), wherein each different GHG is indexed and aggregated against one unit of CO₂ based on their Global Warming Potential (GWP).

directed EPA and NHTSA to align the federal fuel economy and GHG emissions standards with those developed by California. The Administration referred to the coordinated effort as the National Program.²⁴

What Is California’s Authority to Regulate GHG Emissions from Motor Vehicles?²⁵

The California Air Resources Board (CARB) derives its authority to regulate GHG emissions from motor vehicles from California Assembly Bill (AB) 1493.²⁶

Congress can preempt state laws or regulations within a field entirely, preempt only state laws or regulations that conflict with federal law, or allow states to act freely or seek a waiver from preemption.²⁷ Title II of the CAA generally preempts states from adopting their own emissions standards for new motor vehicles or engines.²⁸ However, CAA Section 209(b) provides an exception to federal preemption of state vehicle emissions standards:

The [EPA] Administrator shall, after notice and opportunity for public hearing, waive application of this section [the preemption of State emission standards] to any State which has adopted standards (other than crankcase emission standards) for the control of emissions from new motor vehicles or new motor vehicle engines prior to March 30, 1966, if the State determines that the State standards will be, in the aggregate, at least as protective of public health and welfare as applicable Federal standards.²⁹

Only California can qualify for such a preemption waiver because it is the only state that adopted motor vehicle emissions standards “prior to March 30, 1966.”³⁰ According to EPA records, since 1967, CARB has submitted over 100 waiver requests for new or amended standards or “within the scope” determinations (i.e., a request that EPA rule on whether a new state regulation is within the scope of a waiver that EPA has already issued).³¹

On July 22, 2002, California became the first state to enact legislation requiring reductions of GHG emissions from motor vehicles. The legislation, AB 1493, required CARB to adopt

²⁴ Since 2009, the agencies and stakeholder groups have referred to the coordinated program as both the One National Program and the National Program. This report uses the latter term throughout.

²⁵ EPCA preempts states from adopting or enforcing laws “related to” fuel economy standards for automobiles covered by federal standards. 49 U.S.C. §32919. The issue of whether EPCA could preempt state motor vehicle GHG emissions standards is beyond the scope of this report.

²⁶ 2002 CAL. STAT. ch. 200 (codified at CAL. HEALTH & SAFETY CODE § 43018.5).

²⁷ *Gade v. Nat’l Solid Wastes Mgmt. Assn.*, 505 U.S. 88, 98 (1992). Congress can disavow an intent to preempt certain categories of state law by including a “savings clause” to that effect in federal statutes, see, e.g., 29 U.S.C. §1144(b), or by allowing federal administrative agencies to grant “preemption waivers” to states in certain circumstances, see 42 U.S.C. §7543(b).

²⁸ CAA §209(a), 42 U.S.C. §7543(a). See also S.Rept. 91-1196, at 32 (1970).

²⁹ The CAA places three conditions on the grant of such waivers: The Administrator is to deny a waiver if he finds (1) that the state’s determination is arbitrary and capricious; (2) that the state does not need separate standards to meet compelling and extraordinary conditions; or (3) that the state’s standards and accompanying enforcement procedures are not consistent with §202(a) of the act. 42 U.S.C. §7543(b)(1)(A)-(C).

³⁰ S.Rept. 90-403, at 33 (1990).

³¹ See EPA, Vehicle Emissions California Waivers and Authorizations, <https://www.epa.gov/state-and-local-transportation/vehicle-emissions-california-waivers-and-authorizations#state> (listing *Federal Register* notices of waiver requests and decisions); Letter from Kevin de Leon, President pro Tempore, Cal. Senate, et. al., to Xavier Becerra, Att’y Gen., Cal. Dep’t of Justice, March 16, 2017.

regulations requiring the “maximum feasible and cost-effective reduction” of GHG emissions from any vehicle whose primary use is noncommercial personal transportation.³² The reductions applied to motor vehicles manufactured in MY 2009 and thereafter. Under this authority, CARB adopted regulations on September 24, 2004, and submitted a request to EPA on December 21, 2005, for a preemption waiver.

In 2008, EPA denied California’s request for a waiver.³³ As explained in its decision, EPA concluded that “California does not need its GHG standards for new motor vehicles to meet compelling and extraordinary conditions” because “the atmospheric concentrations of these greenhouse gases is [sic] basically uniform across the globe” and are not uniquely connected to California’s “peculiar local conditions.”³⁴ However, under the Obama Administration, EPA reconsidered and reversed the denial, and granted the waiver in 2009.³⁵ In reversing its denial, EPA determined that it is the “better approach” for the agency to evaluate whether California “needs” state standards “to meet compelling and extraordinary conditions” based on California’s need for its motor vehicle program as a whole, and not solely based on GHG standards addressed in the waiver request.³⁶ Under this approach, EPA concluded that it cannot deny the waiver request because California has “repeatedly” demonstrated the need for its motor vehicle program to address “serious” local and regional air pollution problems.³⁷

Upon receiving the waiver, CARB joined EPA and NHTSA to develop the National Program under the Obama Administration. Three key provisions of the 2009 agreement between the Administration, the auto manufacturers, and the State of California were (1) that EPA would grant California the waiver for MYs 2017-2025 (the agency did so on January 9, 2013),³⁸ (2) that California would accept vehicles complying with the federal greenhouse standards as meeting the California standards,³⁹ and (3) that the auto manufacturers would drop their suit against the California standards.

³² The legislation required that CARB standards achieve “the maximum feasible and cost-effective reduction of greenhouse gas emissions from motor vehicles” while accounting for “environmental, economic, social, and technological factors.”

³³ EPA, “California State Motor Vehicle Pollution Control Standards; Notice of Decision Denying a Waiver of Clean Air Act Preemption for California’s 2009 and Subsequent Model Year Greenhouse Gas Emissions,” *73 Federal Register* 12156, March 6, 2008.

³⁴ *Ibid.*, pp. 12159-69.

³⁵ EPA, “California State Motor Vehicle Pollution Control Standards; Notice of Decision Granting a Waiver of Clean Air Act Preemption for California’s 2009 and Subsequent Model Year Greenhouse Gas Emission Standards for New Motor Vehicles,” *74 Federal Register* 32744, July 8, 2009.

³⁶ *Ibid.*, pp. 32761-63.

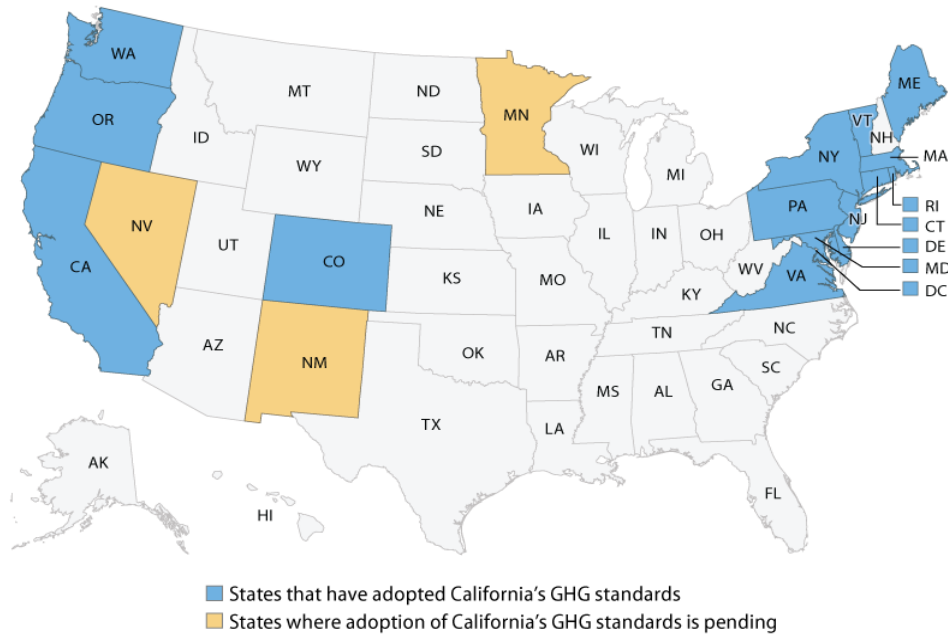
³⁷ *Ibid.*, pp. 32762-63.

³⁸ EPA, “California State Motor Vehicle Pollution Control Standards; Notice of Decision Granting a Waiver of Clean Air Act Preemption for California’s Advanced Clean Car Program and a Within the Scope Confirmation for California’s Zero Emission Vehicle Amendments for 2017 and Earlier Model Years,” *78 Federal Register* 2112, January 9, 2013.

³⁹ Mary D. Nichols, Chairman, CARB, “Letter to Ray LaHood, Secretary, U.S. Department of Transportation, and Lisa Jackson, Administrator, Environmental Protection Agency,” July 28, 2011, <https://www.epa.gov/sites/production/files/2016-10/documents/carb-commitment-ltr.pdf>. The condition set forth by CARB was that the “deemed to comply” provision was contingent upon the U.S. EPA adopting “a final rule that at a minimum preserves the greenhouse reduction benefits set forth in U.S. EPA’s December 1, 2011 Notice of Proposed Rulemaking for 2017 through 2025 model year passenger vehicles.” CARB Resolution 12-11, January 26, 2012, p. 20.

Additionally, the CAA allows other states to adopt California’s motor vehicle emissions standards under certain conditions.⁴⁰ Section 177 requires, among other things, that such standards be identical to the California standards for which a waiver has been granted. States are not required to seek EPA approval under the terms of Section 177. Fourteen other states and the District of Columbia have adopted California’s GHG standards under these provisions (**Figure 3**), and three states are considering them,⁴¹ which would bring nearly 40% of domestic automotive registrations under the California program.⁴²

Figure 3. State Adoption of California’s GHG Standards
States Using or Considering the Use of Clean Air Act Section 177



Source: CRS.

Note: Map is based on state legislative action through June 1, 2021.

⁴⁰ 42 U.S.C. §7507.

⁴¹ See Proposed Permanent Rules Relating to Clean Cars; Notice of Intent to Adopt Rules with a Hearing, 45 Minn. Reg. 663 (Dec. 21, 2020); *Clean Cars Nevada*, NEV. DIV. OF ENV’T. PROT., <https://ndep.nv.gov/air/clean-cars-nevada> (last visited Jan. 27, 2021); Exec. Order 2019-003, Executive Order on Addressing Climate Change and Energy Waste Prevention, New Mexico Gov. Michelle Lujan Grisham (Jan. 29, 2020), https://www.governor.state.nm.us/wp-content/uploads/2019/01/EO_2019-003.pdf.

⁴² New York, Massachusetts, Vermont, Maine, Pennsylvania, Connecticut, Rhode Island, Washington, Maryland, Oregon, New Jersey, Delaware, Colorado, Virginia, and the District of Columbia. Footnote 112 below lists the state laws or other actions that have adopted California’s GHG standards. Total light vehicle registrations in these states and the District of Columbia—passenger cars, vans, SUVs, and pickup trucks—comprise 36% of all U.S. light vehicle registrations in 2019. Wards Intelligence Data Center, “U.S. Total Vehicle Registrations by State by Vehicle Type, 2019,” viewed April 22, 2021. Minnesota, Nevada, and New Mexico are considering adopting California’s vehicle GHG standards; if they do so, 39.9% of all U.S. vehicles will be registered in §177 states. According to the U.S. Department of Commerce’s Bureau of Economic Analysis and the U.S. Census Bureau, respectively, these 17 states and the District of Columbia represented 49% of U.S. gross domestic product and an estimated 42% of U.S. population in 2020.

EPA revoked California’s waiver to regulate vehicle GHG emissions in 2020. In April 2021, EPA announced that it is reconsidering the withdrawal of the waiver. For more detail, see the report section entitled “The Final SAFE Vehicles Rule, Part One.”

What Were the Standards Under the Obama Administration?

EPA and NHTSA promulgated joint rulemakings affecting MY 2012-2016 light-duty motor vehicles on May 7, 2010. These are known as the Phase 1 standards.⁴³ The agencies promulgated a second phase of CAFE and GHG emissions standards affecting MY 2017-2025 light-duty vehicles on October 15, 2012.⁴⁴ The Phase 1 and the Phase 2 standards were preceded by multiparty agreements, brokered by the Obama White House, involving the State of California, auto manufacturers, and the United Auto Workers union. For the Phase 2 standards, the auto manufacturers agreed to reduce GHG emissions from new passenger cars and light trucks by about 50% by 2025, compared to 2010, with fleet-wide average fuel economy rising to nearly 50 miles per gallon. GHG emissions were projected to be reduced to about 160 grams per mile by 2025 under the Phase 2 standards (see **Table 1**).⁴⁵

The standards are applicable to the fleet of new passenger cars and light trucks with gross vehicle weight rating less than or equal to 10,000 pounds sold within the United States in each model year. Fuel economy and carbon-related emissions are tested over EPA’s two test cycles (the Federal Test Procedure [FTP-75], weighted at 55%; and the Highway Fuel Economy Test [HWFET], weighted at 45%).⁴⁶ In addition to the standards for fleet-average fuel economy and GHG emissions (measured and referred to as “CO₂-equivalent emissions” under the regulations),⁴⁷ the rule also includes emissions caps for tailpipe nitrous oxide emissions (0.010 grams/mile) and methane emissions (0.030 grams/mile).

The Phase 1 and Phase 2 standards use the concept of a vehicle’s “footprint” to set differing targets for different size vehicles.⁴⁸ These “size-based,” or “attribute-based,” standards were

⁴³ EPA, “Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule,” 75 *Federal Register* 25324, May 7, 2010.

⁴⁴ EPA and NHTSA, “2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards; Final Rule,” 77 *Federal Register* 62624, October 15, 2012.

⁴⁵ EPA and NHTSA, “2017-2025 Model Year Light-Duty Vehicle GHG Emissions and CAFE Standards: Supplemental Notice of Intent,” 76 *Federal Register* 48758, August 9, 2011. The auto manufacturers’ and CARB’s letters of support can be found at <https://www.epa.gov/regulations-emissions-vehicles-and-engines/2011-commitment-letters-2017-2025-light-duty-national>.

⁴⁶ The Federal Test Procedure (FTP-75) and Highway Fuel Economy Test (HWFET) are chassis dynamometer driving schedules developed by EPA for the determination of fuel economy of light-duty vehicles during city driving and highway driving conditions, respectively (40 C.F.R. pt. 600, subpt. B). EPA also requires the US06 (high acceleration), SC03 (with air conditioning), and cold temperature FTP driving schedules for GHG emissions testing.

⁴⁷ Although CO₂ is the primary GHG, other gases, such as methane (CH₄) and fluorinated gases (e.g., air conditioner refrigerants), also act as GHGs. The calculations of the weighted fuel economy and carbon-related exhaust emissions values are provided for in 40 C.F.R. §600.113-12, and require input of the weighted grams/mile values for CO₂, total hydrocarbons (HC), carbon monoxide (CO), and, where applicable methanol (CH₃OH), formaldehyde (HCHO), ethanol (C₂H₅OH), acetaldehyde (C₂H₄O), nitrous oxide (N₂O), and methane (CH₄). Reductions in other (i.e., nontailpipe) GHG emissions are captured in adjustments made to the compliance standards based on the manufacturer’s use of flex-fuel vehicle, air-conditioning, “off-cycle,” and CH₄ and N₂O deficit credits.

⁴⁸ *Footprint* is defined as the product of a vehicle’s wheelbase and average track width, in square feet. 40 C.F.R. §86.1803-01. The “attribute-based” standards were first introduced in the reformed CAFE program for MY 2008-2011

structurally different from the original CAFE program, which grouped domestic passenger cars, imported passenger cars, and light trucks into three broad categories.⁴⁹ Generally, the larger the vehicle footprint (in square feet), the lower the corresponding vehicle fuel economy target and the higher the CO₂-equivalent emissions target. This allowed auto manufacturers to produce a full range of vehicle sizes as opposed to focusing on light-weighting and downsizing⁵⁰ the entire fleet in order to meet the categorical targets. Nevertheless, the fuel economy and GHG emissions targets grew more stringent each year across all vehicle footprints.

Upon the rulemaking, the agencies expected that the technologies available for auto manufacturers to meet the MY 2017-2025 standards would include advanced gasoline engines and transmissions, vehicle weight reduction, lower tire rolling resistance, improvements in aerodynamics, diesel engines, more efficient accessories, and improvements in air conditioning systems. Some increased electrification of the fleet was also expected through the expanded use of stop/start systems, hybrid vehicles, plug-in hybrid electric vehicles, and electric vehicles.

Table 1. Phase 2 MY 2017-2025 Combined Average Passenger Car and Light Truck CAFE and GHG Emission Standards

	2017	2018	2019	2020	2021	2022	2023	2024	2025
GHG Standard (grams per mile)	243	232	222	213	199	190	180	171	163
GHG-Equivalent Fuel Economy (miles per gallon equivalent)	36.6	38.3	40.0	41.7	44.7	46.8	49.4	52.0	54.5
Fuel Economy (CAFE) Standard (miles per gallon)	35.4	36.5	37.7	38.9	41.0	43.0	45.1	47.4	49.7

Source: CRS, from EPA and NHTSA, “2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards,” 77 *Federal Register* 62624, October 15, 2012.

Notes: The values are based on projected sales of vehicles in different size classes. The standards are size-based, and the vehicle fleet encompasses large, medium, and small cars and light trucks. Thus if the sales mix is different from projections, the achieved CAFE and GHG levels would rise or fall. For example, CAFE numbers are based on NHTSA’s projection using the MY 2008 fleet as the baseline. A different projection, based on the MY 2010 fleet, leads to somewhat lower numbers (roughly 0.3-0.6 mpg lower for MYs 2017-2020 and roughly 0.7-1.0 mpg lower for MY 2021 onward).

GHG-Equivalent Fuel Economy (miles per gallon equivalent) is the value returned if all of the GHG reductions were made through fuel economy improvements. However, in practice, other strategies are used to reduce GHG emissions to the actual GHG standard (for example, improved vehicle air conditioners).

CAFE standards for MYs 2022-2025 are italicized because they were nonfinal (or “augural”). NHTSA has authority to set CAFE standards only in five-year increments. Thus, under Phase 2, NHTSA finalized standards through MY 2021. To set standards for MY 2022 onward, NHTSA was required to issue a new rule.

light trucks. NHTSA, “Average Fuel Economy Standards for Light Trucks; Model Years 2008-2011: Proposed Rule,” 70 *Federal Register* 51413, August 30, 2005.

⁴⁹ The definitions of *passenger car*, *light truck*, and *import* can be found at 49 C.F.R. Part 523.

⁵⁰ *Light-weighting* refers to using lighter weight structural materials to reduce the mass of the vehicle in order to increase fuel efficiency, and *downsizing* refers to designing smaller engines that run at higher loads in order to increase fuel efficiency.

What Does a “Standard of 54.5 MPG in MY 2025” Mean?

The 54.5 number was not a requirement for every—or for any specific—vehicle or manufacturer; it was an estimate of what the agencies acting in 2012 deemed likely to be achieved, on average, by the sales-weighted U.S. fleet of light-duty vehicles in MY 2025. There are several caveats to this number:

- The number is not for every—or for any specific—size or compliance category of vehicle or manufacturer. Different sizes and categories of vehicles have different mpg compliance targets. The number is an estimate of what the average fuel economy achievement would be for a sales-weighted fleet of all vehicles produced by all manufacturers under a specific scenario. This number was estimated during the Phase 2 rulemaking in 2012 using the MY 2008 fleet as the baseline. Thus, if the MY 2025 sales mix and sales volumes are different from projections, the achieved CAFE and GHG levels would be different. An analysis by EPA in 2016 adjusted this number to 50.8 mpg based on updated projections.⁵¹
- This number is based on the fuel economy values returned from EPA’s city and highway laboratory test procedures. The number does not reflect real-world performance. Real-world adjusted fuel economy values are about 20% lower, on average, than the unadjusted fuel economy values that form the starting point for CAFE and GHG standard compliance. Hence, the fuel economy stickers required on new automobiles would not show the fuel economy numbers used in the EPA analysis. For example, a CAFE standard of 31 mpg is the equivalent of 24 mpg on a vehicle sticker.⁵²
- The number is based on EPA’s GHG emissions estimates, not NHTSA’s fuel economy estimates. Thus, it represents the CO₂-equivalent fuel economy (in miles per gallon equivalent) for an emissions estimate of 163 grams of CO₂-equivalent per mile. While a significant portion of GHG reductions would likely come from greater fuel economy, GHG reductions can come from other sources on the vehicle (e.g., methane and nitrous oxide reductions, air-conditioning improvements). NHTSA’s 2012 projection for fuel economy achievement is 49.7 mpg.
- This number, as an estimate, also includes some of the flexibilities, credits, and incentives available to manufacturers under the standards that can be used in lieu of fuel economy achievements.⁵³

What Was the Midterm Evaluation?

As part of the Phase 2 rulemaking, EPA and NHTSA made a commitment to conduct a midterm evaluation (MTE) for the latter half of the standards, MYs 2022-2025.⁵⁴ The agencies deemed an MTE appropriate given the long time frame during which the standards were to apply and the uncertainty about how motor vehicle technologies would evolve. EPA, NHTSA, and California also have differing statutory obligations. That is, EPA, California, and some other states—through their authorities under the CAA, California AB 1493, and other state statutes—had finalized GHG emissions standards through MY 2025. Under the MTE, EPA and CARB were to decide whether to revise their standards. NHTSA, through its authorities under EPCA, had finalized standards only through MY 2021, and would require new rulemaking for the period MYs 2022-2025.

Through the MTE, the EPA Administrator was to determine whether EPA’s standards for MYs 2022-2025 were still appropriate given the latest available data and information.⁵⁵ A final

⁵¹ EPA, NHTSA, and CARB, “Draft Technical Assessment Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025,” July 2016, p. ES-8, at <https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-greenhouse-gas#TAR>.

⁵² EPA, Office of Transportation & Air Quality, *MPG: Label Values vs. Corporate Average Fuel Economy (CAFE) Values*, EPA-420-B-14-015, March 2014, at <https://nepis.epa.gov/Exe/tiff2png.exe/P100IENA.PNG?-r+75+-g+7+D%3A%5CZYFILES%5CINDEX%20DATA%5C11THRU15%5CTIFF%5C00000668%5CP100IENA.TIF>.

⁵³ For more on the flexibilities, credits, and incentives, see section “How Do Manufacturers Comply with the Standards?”

⁵⁴ 40 C.F.R. §86.1818-12(h).

⁵⁵ The rulemaking specified EPA as the agency to determine whether the standards established for MYs 2022-2025 are appropriate. See 40 C.F.R. §86.1818-12(h).

determination could result in strengthening, weakening, or retaining the current standards. If EPA determined that the standards were appropriate, the agency would “announce that final decision and the basis for that decision.” If EPA determined that the standards should be changed, EPA and NHTSA would be required to “initiate a rulemaking to adopt standards that are appropriate.” Throughout the process, the MY 2022-2025 Phase 2 standards were to “remain in effect unless and until EPA changes them by rulemaking.”

The Phase 2 rulemaking laid out several formal steps in the MTE process, including

- a Draft Technical Assessment Report issued jointly by EPA, NHTSA, and CARB with opportunity for public comment no later than November 15, 2017;
- a Proposed Determination on the MTE, with opportunity for public comment; and
- a Final Determination, no later than April 1, 2018.

EPA, NHTSA, and CARB jointly issued the Draft Technical Assessment Report for public comment on July 27, 2016.⁵⁶ This was a technical report, not a decision document, and examined a wide range of technology, marketplace, and economic issues relevant to the MY 2022-2025 standards. It found

- auto manufacturers are innovating in a time of record sales and fuel economy levels;
- the MY 2022-2025 standards could be met largely with more efficient gasoline-powered cars and with only modest penetration of hybrids and electric vehicles; and
- the “attribute-based” standards preserve consumer choice, even as they protect the environment and reduce fuel consumption.

On November 30, 2016, the Obama Administration’s EPA released a proposed determination stating that the MY 2022-2025 standards remained appropriate and that a rulemaking to change them was not warranted.⁵⁷ The agency based its findings on a Technical Support Document,⁵⁸ the previously released Draft Technical Assessment Report, and input from the auto industry and other stakeholders. On January 12, 2017, in the final days of the Obama Administration, then-EPA Administrator Gina McCarthy finalized the determination and stated that “the standards adopted in 2012 by the EPA remained feasible, practical and appropriate.”⁵⁹

⁵⁶ EPA and NHTSA, “Notice of Availability of Midterm Evaluation Draft Technical Assessment Report for Model Year 2022-2025 Light-Duty Vehicle GHG Emissions and CAFE Standards,” 81 *Federal Register* 49217, July 27, 2016. EPA, NHTSA, and CARB, “Draft Technical Assessment Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025,” EPA-420-D-16-900, July 2016.

⁵⁷ EPA, “Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation,” 81 *Federal Register* 87928, December 6, 2016.

⁵⁸ EPA, Assessment and Standards Division, Office of Transportation and Air Quality, “Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation: Technical Support Document,” EPA-420-R-16-021, November 2016, <https://19january2017snapshot.epa.gov/sites/production/files/2016-11/documents/420r16021.pdf>.

⁵⁹ EPA, “Final Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation,” EPA-420-R-17-001, January 2017, <https://nepis.epa.gov/Exec/ZyPURL.cgi?Dockey=P100QQ91.txt>.

The final action arguably shortened the timeline initially forecast for the MTE, and EPA announced it separately from any NHTSA or CARB announcement. EPA noted its “discretion” in issuing a final determination, saying that the agency “recognizes that long-term regulatory certainty and stability are important for the automotive industry and will contribute to the continued success of the national program.”⁶⁰

Some auto manufacturer associations and other industry groups criticized the results of EPA’s review and reportedly vowed to work with the Trump Administration to revisit EPA’s determination. These groups sought actions such as easing the MY 2022-2025 requirements and/or better aligning NHTSA’s and EPA’s standards.

Has the U.S. Motor Vehicle Market Changed Since 2010?

Motor vehicles sold in recent years include new technologies, such as advanced transmissions, turbocharging, and gasoline direct injection that have resulted in more efficient operations. Stop/start systems, now installed on many new vehicles, turn off the engine entirely when the vehicle is idling at a traffic light or in stopped traffic, reducing fuel consumption. EPA has reported that 11 of the 14 largest auto manufacturers increased fuel economy between MYs 2014 and 2019,⁶¹ due in part to investments in new vehicle technologies.

Since the Obama Administration promulgated Phases 1 and 2 in 2010 and 2012, respectively, the composition of the industry’s sales has changed significantly, as mid-sized SUVs, cross-over vehicles, vans, and pickup trucks—the light truck segment—have increasingly replaced four-door sedans (**Figure 4**). The fuel economy and GHG standards developed in those years—such as the projected target of 54.5 mpg in 2025—were based on the mix of passenger vehicles and light trucks expected to be in the market at that time.

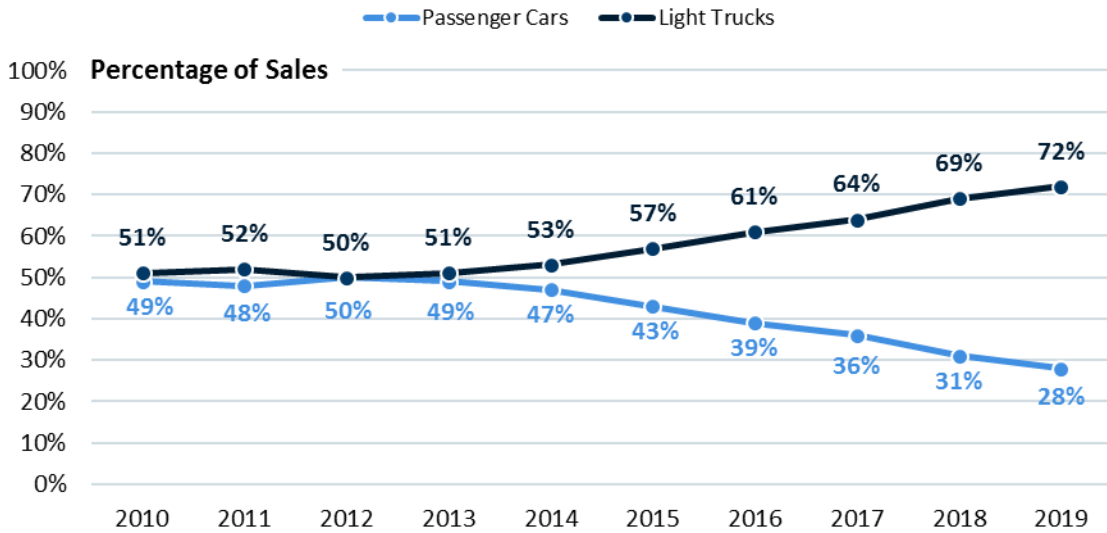
These market shifts may lead to a recalibration of the original standards by the Biden Administration, possibly resulting in lower estimates of average fuel economy and GHG emissions across each model year’s vehicle fleet. A recent EPA report noted that the shift away from passenger sedans “which remain the vehicle type with the highest fuel economy and lowest CO₂ emissions, and towards vehicle types with lower fuel economy and higher CO₂ emissions has offset some of the fleetwide benefits that otherwise would have been achieved...”⁶²

⁶⁰ EPA, “Letter to Stakeholders,” November 30, 2016, <https://www.epa.gov/sites/production/files/2016-11/documents/ld-pd-stkhldr-ltr-2016-11-30.pdf>.

⁶¹ EPA, *The 2020 EPA Automotive Trends Report*, EPA-420-R-21-003, January 2021, p. 8, at <https://www.epa.gov/automotive-trends/download-automotive-trends-report#Full%20Report>.

⁶² *Ibid.*, p. 16.

Figure 4. U.S. Light Vehicles Sales



Source: Wards Intelligence Data Center.

Note: Light trucks include SUVs, vans, and pickup trucks.

What Were the Standards Under the Trump Administration?

The Revised Final Determination

On March 15, 2017, after President Trump took office, EPA and NHTSA announced their joint intention to reconsider the Obama Administration’s final determination and reopen the midterm evaluation process. EPA announced a 45-day public comment period on August 21, 2017, and held a public hearing on September 6, 2017, receiving more than 290,000 comments.⁶³

On April 2, 2018, EPA released a revised final determination, stating that the MY 2022-2025 standards were “not appropriate and, therefore, should be revised.”⁶⁴ The notice stated that the January 2017 final determination was based on “outdated information, and that more recent information suggested that the current standards were too stringent.” In making the revised determination, then-EPA Administrator Scott Pruitt cited and provided comment on several factors from the Phase 2 rulemaking that governed analysis for the midterm evaluation process. These factors included⁶⁵

- the availability and effectiveness of technology, and the appropriate lead time for introduction of technology;

⁶³ EPA, “News Release: EPA to Reexamine Emission Standards for Cars and Light-Duty Trucks—Model Years 2022-2025,” March 15, 2017, <https://www.epa.gov/newsreleases/epa-reexamine-emission-standards-cars-and-light-duty-trucks-model-years-2022-2025>.

⁶⁴ EPA, “Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light-Duty Vehicles: Notice; Withdrawal,” 83 *Federal Register* 16077, April 13, 2018.

⁶⁵ These factors are listed at 40 C.F.R. §86.1818-12(h)(1).

- the cost to the producers or purchasers of new motor vehicles or new motor vehicle engines;
- the feasibility and practicability of the standards;
- the impact of the standards on emissions reduction, oil conservation, energy security, and fuel savings by consumers;
- the impact of the standards on the automobile industry;
- the impact of the standards on automobile safety;
- the impact of the GHG emissions standards on the CAFE standards and a national harmonized program; and
- the impact of the standards on other relevant factors.

The revised final determination stated that EPA and NHTSA would initiate a new rulemaking to consider revised standards for MY 2022-2025 vehicles.⁶⁶ Until that new rulemaking was completed, the Phase 2 standards remained in effect.

The Proposed SAFE Vehicles Rule

On August 24, 2018, EPA and NHTSA proposed amendments to the existing CAFE and GHG emissions standards. The Safer Affordable Fuel-Efficient Vehicles Rule for MY 2021-2026 Passenger Cars and Light Trucks (SAFE Vehicles Rule) offered eight alternatives (see **Table 2**).⁶⁷ The agencies' preferred alternative was to retain the existing standards through MY 2020 and then to freeze them at the MY 2020 level through MY 2026. The preferred alternative also removed the nontailpipe, GHG-exclusive requirements for CO₂-equivalent air conditioning refrigerant leakage, nitrous oxide, and methane after MY 2020.

Further, EPA proposed to withdraw California's CAA preemption waiver for its vehicle GHG standards applicable to MYs 2021-2025. Separately, NHTSA contended that EPCA preempts California's standards because the statute preempts state laws related to federal fuel economy standards.

⁶⁶ EPA has declared that the MTE determination "is not a final agency action," explaining that "a determination that the standards are not appropriate would lead to the initiation of a rulemaking to adopt new standards, and it is the conclusion of that rulemaking that would constitute a final agency action and be judicially reviewable as such." EPA, "Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light-Duty Vehicles: Notice; Withdrawal," 83 *Federal Register* 16078, April 13, 2018. However, several states and stakeholders have filed petitions in the D.C. Circuit seeking judicial review of the revised MTE determination. *See, e.g.*, Petition for Review, California v. EPA, No. 18-1114 (D.C. Cir. May 1, 2018); Petition for Review, Nat'l Coalition for Advanced Transp. v. EPA, No. 18-1118 (D.C. Cir. May 3, 2018); Petition for Review, Center for Biological Diversity v. EPA, No. 18-1139 (D.C. Cir. May 15, 2018).

⁶⁷ EPA and NHTSA, "The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks; Proposed Rule," 83 *Federal Register* 42986, August 24, 2018 [hereinafter *SAFE Rule Proposal*].

Table 2. SAFE Vehicles Rule Regulatory Alternatives

Alternative	Change in Stringency	Air Conditioning and Other Off-Cycle Adjustments	Retention of Provisions for Other GHGs
Baseline/No-Action	MY 2021 standards remain in place; MY 2022-2025 augural CAFE standards are finalized and GHG standards remain unchanged; MY 2026 standards are set at MY 2025 levels	No change	Yes, for all MYs
1 (Preferred)	Existing standards through MY 2020, then 0%/year increases for both passenger cars and light trucks, for MYs 2021-2026	No change	No, beginning in MY 2021
2	Existing standards through MY 2020, then 0.5%/year increases for both passenger cars and light trucks, for MYs 2021-2026	No change	No, beginning in MY 2021
3	Existing standards through MY 2020, then 0.5%/year increases for both passenger cars and light trucks, for MYs 2021-2026	Phase out these adjustments over MYs 2022-2026	No, beginning in MY 2021
4	Existing standards through MY 2020, then 1%/year increases for passenger cars and 2%/year increases for light trucks, for MYs 2021-2026	No change	No, beginning in MY 2021
5	Existing standards through MY 2021, then 1%/year increases for passenger cars and 2%/year increases for light trucks, for MYs 2022-2026	No change	No, beginning in MY 2022
6	Existing standards through MY 2020, then 2%/year increases for passenger cars and 3%/year increases for light trucks, for MYs 2021-2026	No change	No, beginning in MY 2021
7	Existing standards through MY 2020, then 2%/year increases for passenger cars and 3%/year increases for light trucks, for MYs 2021-2026	Phase out these adjustments over MYs 2022-2026	No, beginning in MY 2021
8	Existing standards through MY 2021, then 2%/year increases for passenger cars and 3%/year increases for light trucks, for MYs 2022-2026	No change	No, beginning in MY 2022

Source: EPA and NHTSA, “The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks; Proposed Rule,” 83 *Federal Register* 42986, August 24, 2018.

Notes: Per the proposed rule: “Carbon dioxide equivalent of air conditioning refrigerant leakage, nitrous oxide and methane emissions are included for compliance with the EPA standards for all MYs under the baseline/no action alternative. Carbon dioxide equivalent is calculated using the Global Warming Potential (GWP) [see footnote 23] of each of the emissions. Beginning in MY 2021, the proposal provides that the GWP equivalents of air conditioning refrigerant leakage, nitrous oxide and methane emissions would no longer be able to be included with the tailpipe CO₂ for compliance with tailpipe CO₂ standards.” For more on the structure of the nitrous oxide and methane provisions, and the air conditioning and other off-cycle adjustments, see section “How Do Manufacturers Comply with the Standards?”

Upon the proposal's release, then-DOT Secretary Elaine Chao said, "There are compelling reasons for a new rulemaking on fuel economy standards for 2021-2026. More realistic standards will promote a healthy economy by bringing newer, safer, cleaner and more fuel-efficient vehicles to U.S. roads." Then-EPA Acting Administrator Andrew Wheeler stated, "We are delivering on President Trump's promise to the American public that his administration would address and fix the current fuel economy and greenhouse gas emissions standards. Our proposal aims to strike the right regulatory balance based on the most recent information and create a 50-state solution that will enable more Americans to afford newer, safer vehicles that pollute less. More realistic standards can save lives while continuing to improve the environment." The agencies contended that the proposal reflected the realities of the current marketplace, including substantially lower oil prices than in the original 2012 projection, significant increases in U.S. oil production, and growing consumer demand for larger vehicles.⁶⁸

Comparing the costs and benefits reported under the proposed SAFE Vehicles Rule to those reported under the Phase 2 standards was not straightforward because each set of standards employed different compliance timelines, modeling, inputs, and underlying assumptions. For example, the primary focus of the analysis changed (i.e., from GHG emissions impacts under the Phase 2 standards to fuel use, vehicle miles traveled, and highway accidents under the proposal), and the primary computer model and the modeling agency changed (i.e., from the ALPHA and OMEGA models at EPA to the VOLPE model at NHTSA).⁶⁹ Further, certain modeling assumptions were amended (e.g., the social cost of carbon, new technology costs) and others were added (e.g., a dynamic stock model to estimate the effects of new vehicle sales and existing vehicle scrappage). These changes and their impacts shaped the debate during the proposal's comment period through finalization.

The Final SAFE Vehicles Rule, Part One

The agencies issued their revisions to the CAFE and GHG emissions standards in two parts. The first part addressed primarily legal issues related to preemption and state standards, while the second part amended the substantive fuel economy and GHG standards for MYs 2021 through 2026.

On September 27, 2019, the agencies finalized the Safer, Affordable, Fuel-Efficient (SAFE) Vehicles Rule, Part One: One National Program,⁷⁰ wherein NHTSA asserted its statutory authority to set nationally applicable fuel economy standards under EPCA, which, as interpreted by NHTSA at the time, preempts state and local CO₂ standards because they are "related to" fuel

⁶⁸ U.S. DOT, Press Release: "U.S. DOT and EPA Propose Fuel Economy Standards for MY 2021-2026 Vehicles," August 2, 2018.

⁶⁹ For a discussion of the agencies' modeling systems, see EPA's OMEGA model at <https://www.epa.gov/regulations-emissions-vehicles-and-engines/optimization-model-reducing-emissions-greenhouse-gases> and NHTSA's VOLPE model at <https://www.nhtsa.gov/corporate-average-fuel-economy/compliance-and-effects-modeling-system>.

⁷⁰ EPA and NHTSA, "The Safer, Affordable, Fuel-Efficient (SAFE) Vehicles Rule, Part One: One National Program," 84 *Federal Register* 51310, September 27, 2019 [hereinafter *SAFE Vehicles Rule, Part One*].

economy standards.⁷¹ Under the Supremacy Clause of the U.S. Constitution,⁷² state law that conflicts with federal law must yield to the exercise of Congress’s powers.⁷³ Congress can preempt state laws or regulations in various ways or allow states to act under certain circumstances.⁷⁴ This preemption principle led NHTSA to several conclusions in the Part One rule.

In April 2021, NHTSA proposed to fully repeal and withdraw the Part One rule.⁷⁵ EPA has also initiated reconsideration of its 2019 decision regarding preemption of California’s GHG emissions standards.⁷⁶ The following sections discuss the 2019 Part One rule and the 2021 proposals.

General Scope of EPCA Preemption

EPCA’s preemption provisions state that when a federal fuel economy standard is in effect, a state “may not adopt or enforce a law or regulation *related to* fuel economy standards or average fuel economy standards for automobiles covered by an average fuel economy standard.”⁷⁷ In 2019, NHTSA explained that “as a practical matter, regulating fuel economy controls the amount of tailpipe emissions of carbon dioxide, and regulating the tailpipe emissions of carbon dioxide controls fuel economy.”⁷⁸ Thus, NHTSA concluded in the 2019 Part One rule that any state or local law that regulates or prohibits CO₂ emissions from automobiles is *related to* fuel economy standards, and is therefore preempted under EPCA as invalid (i.e., void *ab initio*).⁷⁹

NHTSA also determined that EPCA preempted state and local zero emission vehicle (ZEV) mandates because they have a *direct or substantial effect of regulating or prohibiting* CO₂ tailpipe emissions from automobiles.⁸⁰ For example, California’s ZEV program required that a certain percentage of a manufacturer’s fleet of passenger cars, light-duty trucks, and medium-duty vehicles sold in the state produce zero exhaust emissions of certain pollutants, including CO₂.⁸¹

⁷¹ *SAFE Vehicles Rule, Part One*, 84 *Federal Register* at 51313. NHTSA concluded that any state or local law or regulation regulating or prohibiting CO₂ tailpipe emissions from automobiles is *expressly* and *impliedly* preempted by EPCA. 84 *Federal Register* at 51356 (emphasis added). “Pre-emption may be either expressed or implied, and ‘is compelled whether Congress’ command is explicitly stated in the statute’s language or implicitly contained in its structure and purpose.’” *Gade v. Nat’l Solid Wastes Mgmt. Ass’n*, 505 U.S. 88, 98 (1992) (quoting *Jones v. Rath Packing Co.*, 430 U.S. 519, 525 (1977)). For further background on federal preemption, see CRS Report R45825, *Federal Preemption: A Legal Primer*, by Jay B. Sykes and Nicole Vanatko.

⁷² U.S. CONST. art. VI, cl. 2.

⁷³ *Gade*, 505 U.S. at 88.

⁷⁴ *Gade*, 505 U.S. at 98. Congress can disavow an intent to preempt certain categories of state law by including a “savings clause” to that effect in federal statutes, see, e.g., 29 U.S.C. §1144(b), or by allowing federal administrative agencies to grant “preemption waivers” to states in certain circumstances, see 42 U.S.C. §7543(b). See *supra* “What Is California’s Authority to Regulate GHG Emissions from Motor Vehicles?”

⁷⁵ NHTSA, “Corporate Average Fuel Economy (CAFE) Preemption; Notice of Proposed Rulemaking,” 86 *Federal Register* 25980, May 12, 2021.

⁷⁶ EPA, “California State Motor Vehicle Pollution Control Standards; Advanced Clean Car Program; Reconsideration of a Previous Withdrawal of a Waiver of Preemption; Opportunity for Public Hearing and Public Comment,” 86 *Federal Register* 22421, April 28, 2021.

⁷⁷ 49 U.S.C. §32919(a) (emphasis added).

⁷⁸ 84 *Federal Register* at 51313 (codified at 49 C.F.R. Parts 531, app. B; 533, app. B).

⁷⁹ *SAFE Vehicles Rule, Part One*, 84 *Federal Register* at 51324. *Ab initio* is defined as “[f]rom the beginning.” *Ab Initio*, BLACK’S LAW DICTIONARY (11th ed. 2019).

⁸⁰ *SAFE Vehicles Rule, Part One*, 84 *Federal Register* at 51320.

⁸¹ CAL. CODE REGS. tit. 13, §1962.2.

NHTSA reasoned that such ZEV mandates affect the average fuel economy achieved by the manufacturer's fleet.⁸² Thus, NHTSA concluded that EPCA preempts state ZEV mandates, such as California's ZEV program, because they are *related to* average fuel economy standards.⁸³ Because NHTSA's revised CAFE standards for MYs 2021-2026 went into effect on June 29, 2020,⁸⁴ EPCA preempts California GHG standards and ZEV mandates for those model years under the interpretation articulated in the Part One rule.

NHTSA described certain state and local GHG requirements that EPCA would not preempt because they have "no bearing on fuel economy."⁸⁵ For example, NHTSA noted that leaking refrigerants from vehicle air conditioning units may emit GHGs when the unit is recharged or crushed at the end of the vehicle's life.⁸⁶ Because state or local laws specifically regulating or prohibiting vehicular refrigerant leakage are not related to a vehicle's fuel economy or tailpipe CO₂ emissions, NHTSA concluded that EPCA would not preempt such state or local laws if narrowly drafted or severable from preempted tailpipe CO₂ emissions standards.⁸⁷

NHTSA adopted regulatory text adding EPCA's statutory preemption provisions and its interpretation in new appendixes to Parts 551 and 553 of Title 49 of the *Code of Federal Regulations*.⁸⁸

In April 2021, NHTSA proposed to repeal the regulations codifying its 2019 interpretation of EPCA's preemption provisions and repeal and withdraw its interpretative statements in the Part One rule.⁸⁹ NHTSA argued that it lacks the authority to "conclusively determine the scope or meaning of the EPCA preemption clauses with the force and effect of law."⁹⁰ NHTSA asserted that "neither EPCA's express preemption provision nor any other statutory source appears to permit NHTSA to adopt legislative rules implementing express preemption under EPCA."⁹¹ Because Congress did not explicitly provide DOT authority to issue regulations defining the scope of the preemption in EPCA, NHTSA viewed EPCA's preemption provisions as "self-executing." As such, NHTSA stated that it "prefers for its codified regulations to return to a state of silence regarding EPCA preemption."⁹²

NHTSA also proposed to repeal and rescind its 2019 interpretative positions regarding EPCA preemption but would not revise or replace its 2019 interpretation in this rulemaking. According to the NHTSA, this repeal and rescission of its 2019 rule and interpretative views would establish a "clean slate" to allow the agency to more fully consider EPCA preemption and how state GHG

⁸² *SAFE Rule Part One*, 84 *Federal Register* at 51320.

⁸³ *SAFE Vehicles Rule, Part One*, 84 *Federal Register* at 51320.

⁸⁴ EPA and NHTSA, "The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks; Final Rule," 85 *Federal Register* 24174, April 30, 2020.

⁸⁵ *SAFE Vehicles Rule, Part One*, 84 *Federal Register* at 51314.

⁸⁶ *SAFE Vehicles Rule, Part One*, 84 *Federal Register* at 51314; *SAFE Rule Proposal*, 84 *Federal Register* at 43235.

⁸⁷ *SAFE Vehicles Rule, Part One*, 84 *Federal Register* at 51314.

⁸⁸ *SAFE Vehicles Rule, Part One*, 84 *Federal Register* at 51324.

⁸⁹ NHTSA, "Corporate Average Fuel Economy (CAFE) Preemption; Notice of Proposed Rulemaking," 86 *Federal Register* 25980, May 12, 2021.

⁹⁰ NHTSA, "Corporate Average Fuel Economy (CAFE) Preemption; Notice of Proposed Rulemaking," 86 *Federal Register* 25982, May 12, 2021.

⁹¹ NHTSA, "Corporate Average Fuel Economy (CAFE) Preemption; Notice of Proposed Rulemaking," 86 *Federal Register* 25982, May 12, 2021.

⁹² NHTSA, "Corporate Average Fuel Economy (CAFE) Preemption; Notice of Proposed Rulemaking," 86 *Federal Register* 25982, May 12, 2021.

vehicle programs may “relate to” fuel economy.⁹³ NHTSA noted that it may decide to issue interpretations or guidance at a later point, if warranted, after further consideration.⁹⁴ The legal status of state and local GHG emissions standards and ZEV mandates, if NHTSA completes its proposed repeal and rescission of the 2019 Part One rule, is therefore unclear. Courts considering challenges to such state and local standards and mandates would likely have to consider the scope of EPCA preemption in the first instance, without the aid of a formal NHTSA interpretation.

Preemption of California’s GHG Standards Under CAA Section 209(b)

The 2019 Part One rule also addressed the CAA Section 209(b) preemption waiver that EPA had granted California in 2013. This waiver covered California’s GHG and ZEV standards for MY 2021-2025 passenger cars and light- and medium-duty trucks.⁹⁵ As discussed above, CAA Section 209(a) generally preempts states from adopting their own emissions standards for new motor vehicles or engines, but it provides an exception for California.⁹⁶ CAA Section 209(b) directs EPA to grant a preemption waiver if California “determines that the State standards will be, in the aggregate, at least as protective of public health and welfare as applicable Federal standards.”⁹⁷ Despite this direction, EPA can deny the waiver request if it finds that (1) California’s determination is arbitrary and capricious, (2) California does not “need such standards to meet compelling and extraordinary conditions,” or (3) the standards and accompanying enforcement procedures are inconsistent with federal emissions standards issued under CAA Section 202(a).⁹⁸

EPA concluded that the 2013 California preemption waiver was “invalid, null, and void” and withdrew it on two separate grounds. First, EPA recognized NHTSA’s determination that EPCA preempts and voids *ab initio* California CO₂ tailpipe emissions standards and ZEV mandate.⁹⁹ Second, EPA determined that California did not need its GHG or ZEV standards for MY 2021-2025 passenger cars, light-duty trucks, and medium-duty vehicles to meet “compelling and extraordinary conditions.”¹⁰⁰

EPA’s decision to withdraw the waiver was based on an interpretation of CAA Section 209(b)(1)(B) that was different from its interpretation in the 2013 waiver decision. In 2013, EPA reviewed whether California “needed” its motor vehicle program as a whole to reduce air pollution, and not solely based on GHG standards addressed in the waiver request.¹⁰¹ Under that

⁹³ NHTSA, “Corporate Average Fuel Economy (CAFE) Preemption; Notice of Proposed Rulemaking,” 86 *Federal Register* 25982, May 12, 2021.

⁹⁴ NHTSA, “Corporate Average Fuel Economy (CAFE) Preemption; Notice of Proposed Rulemaking,” 86 *Federal Register* 25982, May 12, 2021.

⁹⁵ EPA, “California State Motor Vehicle Pollution Control Standards; Notice of Decision Granting a Waiver of Clean Air Act Preemption for California’s Advanced Clean Car Program and a Within the Scope Confirmation for California’s Zero Emission Vehicle Amendments for 2017 and Earlier Model Years,” 78 *Federal Register* 2112, January 9, 2013. The California waivers are also discussed in “What Is California’s Authority to Regulate GHG Emissions from Motor Vehicles?”

⁹⁶ 42 U.S.C. §7543(a). *See also* S. REP. NO. 91-1196, at 32 (1970). The CAA Section 209 is also discussed in “What Is California’s Authority to Regulate GHG Emissions from Motor Vehicles?”

⁹⁷ 42 U.S.C. §7543(b). The waiver provision broadly allows “any State which has adopted standards... for the control of emissions from new motor vehicles or new motor vehicle engines prior to March 30, 1966” to apply for a preemption waiver. *Id.* However, California is the only state that adopted motor vehicle emissions standards “prior to March 30, 1966.” S.Rept. 90-403, at 33 (1990).

⁹⁸ 42 U.S.C. §7543(b)(1)(A)-(C).

⁹⁹ *SAFE Vehicles Rule, Part One*, 84 *Federal Register* at 51338.

¹⁰⁰ *SAFE Vehicles Rule, Part One*, 84 *Federal Register* at 51350.

¹⁰¹ EPA, “California State Motor Vehicle Pollution Control Standards; Notice of Decision Granting a Waiver of Clean

approach, EPA concluded that it would not deny the waiver request because California had “repeatedly” demonstrated the need for its motor vehicle program to address “compelling and extraordinary” local and regional air pollution problems.¹⁰²

In its 2019 interpretation, EPA concluded that the text of Section 209(b)(1)(B) requires the agency to assess whether California needs the standards at issue in the waiver to address compelling and extraordinary conditions, not whether California generally needs a separate state vehicle program to address air pollution from vehicles.¹⁰³ EPA reasoned that Congress intended “compelling and extraordinary conditions” to refer to state-specific pollution problems that have a “particular nexus” to vehicle emissions and the health effects from such pollution.¹⁰⁴ Based on this interpretation of Section 209(b)(1)(B), EPA determined that global GHG emissions and their effects are outside the scope of local or regional air pollution and do not present “compelling and extraordinary conditions” specific to California.¹⁰⁵ EPA explained that California does not “need” its own vehicle GHG standards because the standards will not “meaningfully” address global air pollution problems associated with GHG emissions.¹⁰⁶ The withdrawal of the California waiver became effective on November 26, 2019.¹⁰⁷

In April 2021, EPA initiated reconsideration of its actions in the 2019 Part One rule, announcing a virtual public hearing and an opportunity for public comment.¹⁰⁸ In considering whether to rescind its 2019 action and reinstate California’s waiver, EPA seeks to determine whether it “properly evaluated and exercised its authority to reconsider a previous waiver granted to [California] and whether the withdrawal was a valid and appropriate exercise of authority and consistent with judicial precedent.”¹⁰⁹ EPA stated that it would accept public comments until July 6, 2021.¹¹⁰

Preemption of Other State GHG Standards Under CAA Section 177

The waiver withdrawal also affects the states that have adopted the California motor vehicle GHG emissions standards. CAA Section 177 allows states, under certain conditions, “to adopt and enforce new motor vehicle emissions standards that are identical to the California standards for

Air Act Preemption for California’s Advanced Clean Car Program and a Within the Scope Confirmation for California’s Zero Emission Vehicle Amendments for 2017 and Earlier Model Years,” 78 *Federal Register* 2112, January 9, 2013.

¹⁰² 78 *Federal Register* at 2129.

¹⁰³ *SAFE Vehicles Rule, Part One*, 84 *Federal Register* at 51344.

¹⁰⁴ See *SAFE Vehicles Rule, Part One*, 84 *Federal Register* at 51340, 51350 (concluding that this interpretation of the “compelling and extraordinary” provision “is the best, if not the only, reading of that provision.”). EPA’s interpretation appears similar, but not identical, to its reasoning in a previous waiver denial in 2008. *Ibid.* at 51339-40. EPA noted that its 2019 interpretation of CAA §209(b)(1)(B) took a different approach from its 2008 waiver denial. *Ibid.*

¹⁰⁵ *SAFE Vehicles Rule, Part One*, 84 *Federal Register* at 51349.

¹⁰⁶ *SAFE Vehicles Rule, Part One*, 84 *Federal Register* at 51340-49.

¹⁰⁷ *SAFE Vehicles Rule, Part One*, 84 *Federal Register* at 51310, 51350.

¹⁰⁸ EPA, “California State Motor Vehicle Pollution Control Standards; Advanced Clean Car Program; Reconsideration of a Previous Withdrawal of a Waiver of Preemption; Opportunity for Public Hearing and Public Comment,” 86 *Federal Register* 22421, April 28, 2021.

¹⁰⁹ EPA, “California State Motor Vehicle Pollution Control Standards; Advanced Clean Car Program; Reconsideration of a Previous Withdrawal of a Waiver of Preemption; Opportunity for Public Hearing and Public Comment,” 86 *Federal Register* 22423, April 28, 2021.

¹¹⁰ EPA, “California State Motor Vehicle Pollution Control Standards; Advanced Clean Car Program; Reconsideration of a Previous Withdrawal of a Waiver of Preemption; Opportunity for Public Hearing and Public Comment,” 86 *Federal Register* 22421-22, April 28, 2021.

which a waiver has been granted for [a given] model year.”¹¹¹ Section 177 requires that the state adopting the standards have an approved state implementation plan to meet or attain national ambient air quality standards (NAAQS) for certain specified pollutants (ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, and particulate matter). Fourteen additional states and the District of Columbia have adopted California’s vehicle GHG standards, and 12 of those states have also adopted California’s ZEV mandates.¹¹² Because EPA has withdrawn the California waiver, these states and the District of Columbia have no authority under CAA Section 177 to enforce these vehicle GHG standards in their states, and no other states may adopt California’s GHG standards.

In the 2019 Part One rule, EPA also finalized a new interpretation narrowing the scope of CAA Section 177. EPA concluded that Section 177 does not extend to California’s GHG standards because this section applies only to California standards that address criteria pollutants that affect regional or local air quality.¹¹³ EPA reasoned that Section 177 was intended to assist states in reducing emissions of pollutants that are subject to the NAAQS, which tend to have more local effects, and “not to address global air pollution” such as GHGs.¹¹⁴ Therefore, if EPA were to grant California a waiver in the future for new motor vehicle standards for a global pollutant such as GHGs, states would not be able to adopt those standards under EPA’s current interpretation of Section 177’s applicability.

In its 2021 reconsideration, EPA seeks comment on, among other things, whether the agency properly interpreted CAA Section 177 in the 2019 Part One rule, and whether GHG emissions standards adopted by states pursuant to Section 177 may have both criteria emissions and GHG emissions benefits and purposes.¹¹⁵

Litigation of SAFE Vehicles Rule, Part One

Various stakeholders, 23 states, the District of Columbia, and the cities of Los Angeles and New York are challenging the final Part One rule in the U.S. Court of Appeals for the District of Columbia Circuit.¹¹⁶ The petitioners seek to vacate EPA’s waiver withdrawal and Section 177

¹¹¹ 42 U.S.C. §7507.

¹¹² States that have adopted both California’s low emission vehicles (LEV) GHG standards and ZEV mandates are Colorado, 5 COLO. CODE REG. §1001-24; Connecticut, CONN. AGENCIES REGS. §22a-174-36c; Maine, 06-096-127 ME. CODE R. §§1-12; Maryland, MD. CODE REGS. 26.11.34.09; Massachusetts, 310 MASS. CODE REGS. 7.40; New Jersey, N.J. ADMIN. CODE §7:27-29; New York, N.Y. COMP. CODES R. & REGS. tit. 6, §§218-4.1, 218-8.1-8.5; Oregon, OR. ADMIN. R. 340-257-0040, -0050, -0080; Rhode Island, 250-120 R.I. CODE R. Part 37; Vermont, 12-031-001 VT. CODE R. §5-1106(6); Virginia, 2021 Va. Leg. Serv. 1st Sp. Sess. ch. 263 (H.B. 1965) (West); and Washington, WASH. REV. CODE §70A.30.010, WASH. ADMIN. CODE 173-423-050. States that adopted LEV GHG standard only are Delaware, 7-1000-1140 DEL. ADMIN. CODE §5; Pennsylvania, 25 PA. CODE §126.411; and the District of Columbia, D.C. CODE §50-731. Minnesota, Nevada, and New Mexico are considering adopting California’s vehicle GHG standards. See Proposed Permanent Rules Relating to Clean Cars; Notice of Intent to Adopt Rules with a Hearing, 45 Minn. Reg. 663 (Dec. 21, 2020); *Clean Cars Nevada*, NEV. DIV. OF ENV’T. PROT., <https://ndep.nv.gov/air/clean-cars-nevada> (last visited Jan. 27, 2021); Exec. Order 2019-003, Executive Order on Addressing Climate Change and Energy Waste Prevention, Gov. Michelle Lujan Grisham (Jan. 29, 2020), https://www.governor.state.nm.us/wp-content/uploads/2019/01/EO_2019-003.pdf. See *supra* **Figure 3**.

¹¹³ *SAFE Vehicles Rule, Part One*, 84 *Federal Register* at 51350.

¹¹⁴ *SAFE Vehicles Rule, Part One*, 84 *Federal Register* at 51351.

¹¹⁵ EPA, “California State Motor Vehicle Pollution Control Standards; Advanced Clean Car Program; Reconsideration of a Previous Withdrawal of a Waiver of Preemption; Opportunity for Public Hearing and Public Comment,” 86 *Federal Register* 22421, April 28, 2021.

¹¹⁶ *Union of Concerned Scientists v. NHTSA*, No. 19-1230 (D.C. Cir. 2019) (consolidating all petitions of review). The state and local government petitioners are California, Colorado, Connecticut, Delaware, Hawaii, Illinois, Maine,

determination as unlawful, and NHTSA's preemption rule as exceeding NHTSA's authority.¹¹⁷ They also argue that NHTSA violated the National Environmental Policy Act (NEPA) by failing to prepare any environmental review documents for its preemption rule.¹¹⁸ Twelve states intervened in support of the agencies.¹¹⁹ Various entities, including some Members of Congress, submitted *amici curiae* briefs in support of the petitioners or in support of EPA and NHTSA.¹²⁰ Parties submitted their final briefs to the court on October 27, 2020. On February 8, 2021, the D.C. Circuit granted the agencies' request to pause the litigation pending the conclusion of the agencies' review and potential rescission or revision of the SAFE Vehicles Rule.¹²¹ In seeking the pause, the agencies asserted that the rule review was required under Executive Order 13990, which specifically directed the agencies to "consider publishing for notice and comment a proposed rule suspending, revising, or rescinding" the SAFE Vehicles Rule, Part One by April 2021 and Part Two by July 2021.¹²² The court has ordered the agencies to file status reports on their review of the SAFE Vehicles Rule every 90 days and notify the court and the parties within seven days of any agency action resulting from the review.¹²³

Maryland, Minnesota, Michigan, Nevada, New Jersey, New Mexico, New York, North Carolina, Oregon, Rhode Island, Vermont, Washington, and Wisconsin; the Commonwealths of Massachusetts, Pennsylvania, and Virginia. Brief of State & Local Government Petitioners & Public Interest Petitioners at i, *Union of Concerned Scientists v. NHTSA*, No. 19-1230 (D.C. Cir. June 29, 2020). Several of the D.C. Circuit petitioners also filed a complaint challenging NHTSA's preemption rule in U.S. District Court for the District of Columbia, arguing that the D.C. Circuit lacks jurisdiction to review the rule. Complaint at 8, *California v. Chao*, No. 1:19-cv-02826 (D.D.C. Sept. 20, 2019); Brief of State & Local Government Petitioners & Public Interest Petitioners at 73, *Union of Concerned Scientists v. NHTSA*, No. 19-1230 (D.C. Cir. June 29, 2020). The D.C. federal district court stayed the case pending resolution of the D.C. Circuit litigation. Order, *California v. Chao*, No. 1:19-cv-02826 (D.D.C. Feb. 11, 2020). Further discussion of the legal arguments raised in the litigation is beyond the scope of this report.

¹¹⁷ Brief of State & Local Government Petitioners & Public Interest Petitioners at 22-26, *Union of Concerned Scientists v. NHTSA*, No. 19-1230 (D.C. Cir. June 29, 2020).

¹¹⁸ Brief of State & Local Government Petitioners & Public Interest Petitioners at 108-109, *Union of Concerned Scientists v. NHTSA*, No. 19-1230 (D.C. Cir. June 29, 2020).

¹¹⁹ Brief of Intervenor the States Ohio, Alabama, Arkansas, Georgia, Indiana, Louisiana, Missouri, Nebraska, South Carolina, Texas, Utah, and West Virginia, *Union of Concerned Scientists v. NHTSA*, No. 19-1230 (D.C. Cir. Sept. 21, 2020).

¹²⁰ See, e.g., Brief of *Amici Curiae* Members of Congress in Support of Petitioners, *Union of Concerned Scientists v. NHTSA*, No. 19-1230 (D.C. Cir. July 6, 2019); Brief of *Amicus Curiae* Chamber of Commerce of the United States of America in Support of Respondents, *Union of Concerned Scientists v. NHTSA*, No. 19-1230 (D.C. Cir. Sept. 16, 2020). The Coalition for Sustainable Automotive Regulation, Inc. and Automotive Regulatory Council, Inc. filed a motion to withdraw as respondent-intervenors from the lawsuit. *Union of Concerned Scientists v. NHTSA*, No. 19-1230 (D.C. Cir. Feb. 2, 2021). The Coalition for Sustainable Automotive Regulation is a group of automobile manufacturers and dealer groups, which include FCA US LLC, Hyundai, Kia, Mazda, Mitsubishi, National Automobile Dealers Association, Subaru, and Toyota. Coalition for Sustainable Automotive Regulation, "About Us," <https://www.coalitionforsustainableautoregs.org/about-the-coalition>. The Automotive Regulatory Council is a trade association representing the automotive safety industry. Automotive Regulatory Council, "About Us," <https://www.automotivesafetycouncil.org/about-us/>.

¹²¹ Order at 1, *Union of Concerned Scientists v. NHTSA*, No. 19-1230 (D.C. Cir. Feb. 8, 2021).

¹²² Motion to Hold Cases in Abeyance Pending Implementation of Executive Order and Conclusion of Potential Reconsideration at 3-4, *Union of Concerned Scientists v. NHTSA*, No. 19-1230 (D.C. Cir. Feb. 1, 2021). See also EPA, "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis." 86 *Federal Register* 7037, 7037-38, January 25, 2021.

¹²³ Order at 1-2, *Union of Concerned Scientists v. NHTSA*, No. 19-1230 (D.C. Cir. Feb. 8, 2021).

The Final SAFE Vehicles Rule, Part Two

The agencies finalized the second part of the SAFE Vehicles Rule on April 30, 2020.¹²⁴ The new rule required a 1.5% increase in fuel economy each year from MY 2021 to MY 2026, attaining a projected fleet-wide fuel economy target of 40.4 mpg in MY 2026. (This compares to an approximate 5% increase each year under the Phase 2 standards.)¹²⁵ The new rule retained many of the flexibilities of the Phase 2 standards, including the credit system and the adjustments for air conditioning improvements, methane and nitrous oxide emissions reductions, and off-cycle technologies. The new rule phased out the GHG credit multiplier for electric vehicles in MY 2022 (as did the Phase 2 standards). However, it extended the multiplier for natural gas vehicles through MY 2026.

Table 3. SAFE Vehicles Rule MY 2017-2026 Combined Average Passenger Car and Light Truck CAFE and GHG Emissions Standards

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
GHG Standard (grams per mile)	261	248	236	224	214	211	207	204	202	199
Fuel Economy (CAFE) Standard (miles per gallon)	33.8	34.8	35.7	36.8	37.3	37.9	38.5	39.1	39.8	40.4

Source: CRS, from EPA and NHTSA, “The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks; Final Rule,” 85 *Federal Register* 24174, April 30, 2020.

Notes: The values are based on projected sales of vehicles in different size classes (see notes for **Table I**). The CAFE and GHG numbers are based on NHTSA’s projection using the MY 2016 fleet as the baseline.

In their regulatory impact analysis,¹²⁶ NHTSA and EPA estimated the changes attributable to the SAFE Vehicles Rule over the lifetime of the vehicles projected to be sold through MY 2029 in comparison to the Phase 2 standards. The agencies estimated that the SAFE Vehicles Rule would reduce total costs by \$200 billion (including a \$100 billion reduction in automakers’ compliance costs), reduce the average price of a new vehicle by \$1,000, reduce highway fatalities by 3,300, and increase new vehicle sales by 2.7 million. However, the agencies projected that vehicles would consume an additional 2 billion barrels of oil, emit an additional 867-923 million metric tons of GHGs, and cause an additional 440 to 1,000 premature deaths due to air pollution. Further, the agencies estimated that the SAFE Vehicles Rule would reduce auto-sector jobs by 10,000 to 20,000 job years annually through MY 2030 due to the reduced focus on fuel-saving

¹²⁴ EPA and NHTSA, “The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks; Final Rule,” 85 *Federal Register* 24174, April 30, 2020.

¹²⁵ According to EPA and NHTSA, “When the agencies state that stringency will increase at 1.5 percent per year, that means that the footprint curves which actually define the standards for CAFE and CO₂ emissions will become more stringent at 1.5 percent per year. Consistent with Congress’s direction in EISA to set CAFE standards based on a mathematical formula, which EPA harmonized with for the CO₂ emissions standards, the standard curves are equations, which are slightly different for CAFE and CO₂, and within each program, slightly different for passenger cars and light trucks. Each program has a basic equation for a fleet standard, and then values that change to cause the stringency changes are the coefficients within the equations.” See EPA and NHTSA, “The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks; Final Rule,” 85 *Federal Register* 24188, April 30, 2020.

¹²⁶ EPA and NHTSA, “Final Regulatory Impact Analysis: The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Year 2021-2026 Passenger Cars and Light Trucks,” March 2020.

technologies. In summary, NHTSA and EPA estimated that the cumulative effects to society of the SAFE Vehicles Rule could range from a net benefit of \$16.1 billion to a net cost of \$22.0 billion, dependent upon the program specifics, input assumptions, and discount rate modeled.

Various states, local governments, and environmental and consumer organizations filed petitions for review in the D.C. Circuit challenging EPA's revised GHG emissions standards and NHTSA's revised CAFE standards for light-duty vehicles in the 2020 SAFE Vehicles Rule, Part Two.¹²⁷ The Competitive Enterprise Institute also filed a petition for review in the D.C. Circuit, alleging that the agencies failed to adequately consider the adverse traffic safety impacts of their standards.¹²⁸ On April 2, 2021, the D.C. Circuit granted the agencies' request to pause the litigation pending the conclusion of the agencies' review and potential rescission or revision of the SAFE Vehicles Rule, Part Two.¹²⁹ The court has ordered the agencies to file status reports on their review of the rule every 90 days and notify the court and the parties within 7 days of any agency action resulting from the review.¹³⁰

California's Regulatory Activities

EPA and NHTSA under the Trump Administration met with California to discuss the MTE, the MY 2022-2025 GHG standards, and post-2025 GHG standards. Efforts focused on establishing a single national standard for fuel economy and GHG emissions in order to avoid a situation in which manufacturers must deal with a patchwork of competing state regulations.¹³¹

California restated its continued support for the federal Phase 2 and its state's standards. On March 24, 2017, CARB passed a resolution to accept its staff's midterm evaluation of the state's Advanced Clean Car program—which included MY 2017-2025 vehicle GHG standards in line with EPA's 2017 final determination and the 2012 rulemaking.¹³² Effective December 12, 2018, CARB adopted a regulatory amendment to clarify that automakers must still comply with the state's existing light-duty vehicle GHG standards through MY 2025 even if EPA and NHTSA approve a rollback of the equivalent national rules.¹³³

Premised on an expectation that CARB and the Trump White House would not reach an accord on the revisions, California announced on July 25, 2019, that the state reached agreements with four major automakers to implement voluntary fuel economy and GHG limits through MY 2026

¹²⁷ See, e.g., Petition for Review, *California v. Wheeler*, No. 20-1167 (D.C. Cir. May 27, 2020), consolidated under *Competitive Enterprise Institute v. NHTSA*, No. 20-1145 (D.C. Cir.). Further discussion of the legal arguments raised in the litigation is beyond the scope of this report.

¹²⁸ Petition for Review, *Competitive Enterprise Institute v. NHTSA*, No. 20-1145 (D.C. Cir. May 1, 2020).

¹²⁹ Order at 1, *Competitive Enterprise Institute v. NHTSA*, No. 20-1145 (D.C. Cir. Apr. 2, 2021).

¹³⁰ Order at 1-2, *Competitive Enterprise Institute v. NHTSA*, No. 20-1145 (D.C. Cir. Apr. 2, 2021).

¹³¹ In response to questions about the CAFE/GHG standards and California's waiver status, then-EPA Administrator Scott Pruitt stated that "there are ongoing discussions with CARB in California, the agency that oversees these matters. It is our hope that we can come to a resolution as we visit about these standards in April of this year. Senator, federalism doesn't mean that one State can dictate to the rest of the Country, that we recognize California's special status on the statute. And we are working with them to find consensus around these issues." U.S. Congress, Senate Committee on Environment and Public Works, *Oversight Hearing to Receive Testimony from Environmental Protection Agency Administrator Scott Pruitt*, 115th Cong., January 30, 2018, p. 72.

¹³² CARB, "2017 Midterm Review Report," at <https://ww2.arb.ca.gov/resources/documents/2017-midterm-review-report>.

¹³³ See documents related to CARB's amendments at CARB: Proposed Amendments to the Low- Emission Vehicle III Greenhouse Gas Emission Regulation," <https://ww2.arb.ca.gov/rulemaking/2018/proposed-amendments-low-emission-vehicle-iii-greenhouse-gas-emission-regulation>.

that fell roughly midway between the Phase 2 standards and the Trump Administration's proposal.¹³⁴ The companies were BMW, Ford, Honda, and Volkswagen, which represent approximately one-third of the U.S. new vehicle market. Volvo subsequently joined the agreement.¹³⁵ The terms of the agreements were as follows:

- “Revised Greenhouse Gas Standards: GHG standards, beginning in the 2022 model year (MY) and extending through the 2026 MY, with increasing stringency at a nationwide average annual rate of 3.7% (year-over-year). Of the 3.7% annual stringency, 1% can be achieved using the advanced technology multiplier credits, below.
- “Appropriate Flexibilities to Promote Zero Emission Technology: Continue current advanced technology multipliers that now expire after MY 2021, extending them through MY 2024 at the current 2.0x for Battery Electric and Fuel Cell Electric Vehicles (BEV/FCEV), and 1.6x for Plug-in Hybrid Electric Vehicles (PHEV), tapering off at the current MY 2020 and MY 2021 levels in MY 2025 and MY 2026, respectively.
- “Simplify Accounting: Remove the requirement to account for upstream emissions of fuels, as these can be addressed by other programs.
- “Increase Innovation: Raise the current cap on off-cycle menu credits, which account for actions taken outside the formal test cycle framework, from 10 grams [CO₂e] per mile to 15 grams per mile starting in MY 2020.
- “Streamlining and Process Improvements: Improve the off-cycle credit program to facilitate timely review and decision-making regarding the approval of new off-cycle technologies.
- “Recognize California's Authority: Participating companies are choosing to pursue a voluntary agreement in which California accepts these terms as compliance with its program, given its authority, rather than challenge California's GHG and ZEV programs.”¹³⁶

It remains unclear how California would proceed with the agreement under the final SAFE Vehicles Rule, which withdrew California's waiver under the CAA and preempted state GHG standards related to tailpipe emissions under EPCA. However, under the Biden Administration, discussion has turned to using the California agreement as a model for the rules' revisions.¹³⁷

¹³⁴ Office of the Governor, “California and Major Automakers Reach Groundbreaking Framework Agreement on Clean Emission Standards,” July 25, 2019, <https://www.gov.ca.gov/2019/07/25/california-and-major-automakers-reach-groundbreaking-framework-agreement-on-clean-emission-standards/>.

¹³⁵ See the automakers' agreements at CARB, “Framework Agreements on Clean Cars,” at <https://ww2.arb.ca.gov/news/framework-agreements-clean-cars>.

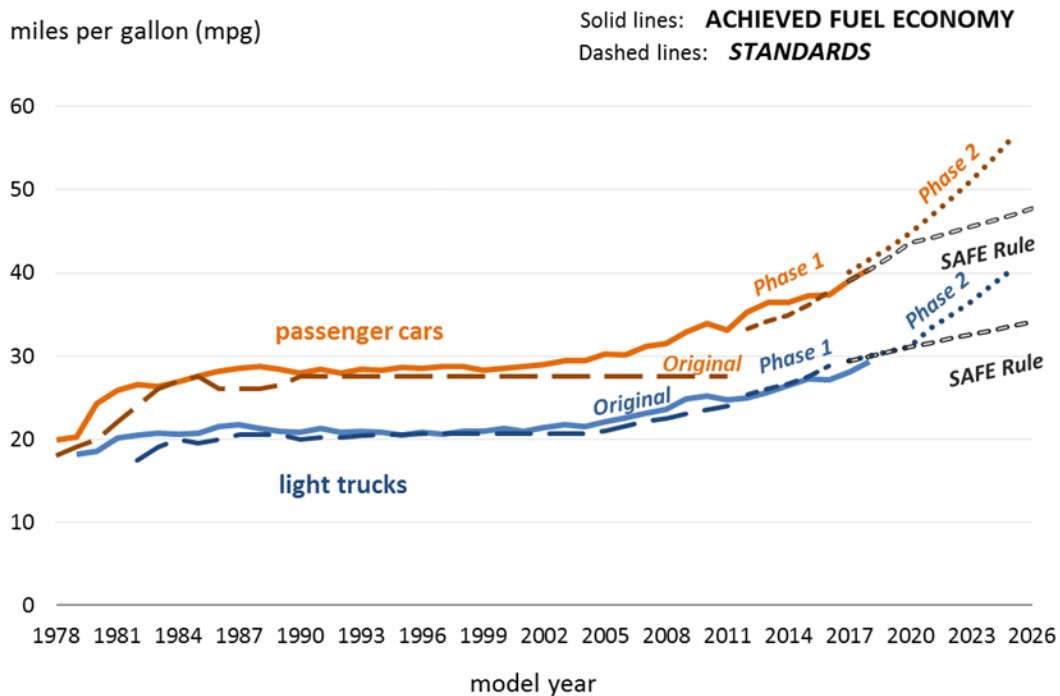
¹³⁶ Office of the Governor, “California and Major Automakers Reach Groundbreaking Framework Agreement on Clean Emission Standards,” July 25, 2019.

¹³⁷ For example, on November 12, 2020, CARB Chairperson Mary Nichols said California's framework deal with automakers on emissions, announced in July 2019 and finalized in August 2020, “is a good template and then we should be moving on to the next generation of regulation.” As reported by Nichola Groom and David Shepardson, “California official sees state auto emissions deal as ‘template’ for Biden,” Reuters, November 12, 2020.

How Do Manufacturers Comply with the Standards?

Under the regulations, manufacturers must report the characteristics of the vehicles they sell in each model year. This information allows EPA and NHTSA to calculate each manufacturer’s CAFE and GHG targets under the standards given the specific pattern of sales. The agencies compare the calculated targets against the vehicles’ fuel economy and emissions results from EPA-approved test cycles to determine each manufacturer’s compliance with the applicable standards. **Figure 5** compares CAFE standards, as promulgated for both passenger cars and light trucks over MYs 1978-2026, against the U.S. fleets’ adjusted performance data as reported by NHTSA for the given model years. **Table 4** lists the most recent adjusted performance projections reported by the agencies—MY 2019—for each manufacturer and its fleets.

Figure 5. CAFE Standards and Achieved Fuel Economy, MYs 1978-2026



Sources: CRS, from NHTSA, *Manufacturer Projected Fuel Economy Performance Report*, October 11, 2019; EPA, *The 2020 EPA Automotive Trends Report: Greenhouse Gas Emissions, Fuel Economy, and Technology Since 1975*, January 2021.

Notes: “CAFE Achieved” mpg are the values reported under Table 2 of NHTSA’s annual *Manufacturer Projected Fuel Economy Performance Reports*. “CAFE Standards” are as they were projected at the publication of the respective final rules, including “Original” (NHTSA’s CAFE program); “Phase 1” (75 *Federal Register* 25324, May 7, 2010); “Phase 2” (77 *Federal Register* 62624, October 15, 2012); and “SAFE Rule” (85 *Federal Register* 24174, April 30, 2020).

Because of the “attribute-based” standards, compliance targets are different for each manufacturer depending on the vehicles it produces. As stated by NHTSA: “Manufacturers are not compelled to build light-duty vehicles of any particular size or type, and each manufacturer will have its own

standard which reflects the vehicles it chooses to produce.”¹³⁸ The agencies contend: “Under the National Program automobile manufacturers will be able to continue building a single light-duty national fleet that satisfies all requirements under both programs while ensuring that consumers still have a full range of vehicle choices that are available today.”¹³⁹

To facilitate compliance, the agencies provide manufacturers various flexibilities under the standards. A manufacturer’s fleet-wide performance (as measured on EPA’s test cycles) can be adjusted through the use of flex-fuel vehicles, air-conditioning efficiency improvements, and other “off-cycle” technologies (e.g., active aerodynamics, thermal controls, and idle reduction).¹⁴⁰ Further, manufacturers can generate credits for overcompliance with the standards in a given year. They can bank, borrow, trade, and transfer these credits, both within their own fleets and among other manufacturers, to facilitate annual compliance. They can also offset current deficits using future credits (either generated or acquired within three years) to determine final compliance.¹⁴¹ A CAFE credit is earned for each 0.1 mpg in excess of the fleet’s standard mpg. A GHG credit is earned for each megagram (Mg, or metric ton) of CO₂-equivalent saved relative to the standard as calculated for the projected lifetime of the vehicle. **Table 5** summarizes GHG credits that are available to each manufacturer after MY 2019, reflecting all completed trades and transfers, as reported by EPA. (NHTSA’s CAFE credit balances by manufacturer for MY 2019 have not been reported.)

The auto manufacturers completed MY 2019 compliance with 229 million metric tons of GHG credits under EPA’s program. Many manufacturers chose to use credits for their MY 2019 compliance. It was the fourth consecutive model year that the auto manufacturers depleted total industry credits after four years of the industry accumulating credits (**Figure 6**). In addition to the industry-wide credit balance, factors that may affect future compliance include credit expiration and distribution. Credits earned by manufacturers in MY 2017 or beyond have a five-year lifespan, while all prior credits (67% of the total) are to expire at the end of MY 2021.¹⁴²

Under the CAFE program, manufacturers can comply with the standards by paying a civil penalty. The CAFE penalty began as \$5.50 per 0.1 mpg over the standard, per vehicle.¹⁴³ Historically, some manufacturers have opted to comply with the standards in this way, especially for low-volume, luxury imported vehicles.¹⁴⁴ Beginning with MY 2019, NHTSA was scheduled to assess a civil penalty of \$14 per 0.1 mpg over the standard as provided by the Federal Civil Penalties Inflation Adjustment Act Improvements Act of 2015 within the Bipartisan Budget Act of 2015 (P.L. 114-74) and subsequent rulemaking.¹⁴⁵ On August 26, 2019, NHTSA finalized a

¹³⁸ NHTSA, “Fact Sheet: NHTSA and EPA Propose to Extend the National Program to Improve Fuel Economy and Greenhouse Gases for Passenger Cars and Light Trucks,” p. 3, https://morningconsult.com/wp-content/uploads/2017/06/2017-25_CAFE_NPRM_Factsheet.pdf.

¹³⁹ EPA and NHTSA, “2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards; Final Rule,” 77 *Federal Register* 62624, October 15, 2012.

¹⁴⁰ “Off-cycle” refers to technologies that result in real-world emissions and fuel economy benefits, but where the benefits are not adequately captured on the test procedures used by manufacturers to demonstrate compliance.

¹⁴¹ Both NHTSA and EPA consider total vehicle miles traveled (VMT) for the different vehicle compliance categories (DPC, IPC, LT) when calculating credit values. EPA incorporates this calculation prior to awarding credits. NHTSA employs an adjustment factor during the trading or transferring of credits across compliance categories.

¹⁴² EPA, “The 2020 EPA Automotive Trends Report: Greenhouse Gas Emissions, Fuel Economy, and Technology Since 1975,” January 2021.

¹⁴³ 49 U.S.C. §32912.

¹⁴⁴ NHTSA reports annually the amounts paid in civil penalties by manufacturer. See https://one.nhtsa.gov/cale_pic/CAFE_PIC_Fines_LIVE.html.

¹⁴⁵ The goal of the 2015 law is to adjust federal penalties for inflation in line with the original intent of underlying

rule to retain the existing penalty rate of \$5.50 applicable to automobile manufacturers that fail to meet CAFE standards, having proposed that increasing the CAFE civil penalty rate would have a negative economic impact.¹⁴⁶

Various states and environmental groups successfully challenged the 2019 rule in court. In 2020, the U.S. Court of Appeals for the Second Circuit vacated the 2019 rule. The court concluded that the Improvements Act does not permit agencies to reconsider the economic effects of their inflation adjustments once certain statutory time frames had passed, and that NHTSA had therefore exceeded its statutory authority when it reversed its prior decision and returned the CAFE penalty to \$5.50.¹⁴⁷ The court declared that NHTSA's 2016 rule raising the CAFE base penalty rate to \$14 is now in force.¹⁴⁸

On January 14, 2021, NHTSA issued an interim final rule, applying the \$14 penalty rate beginning with MY 2022 vehicles.¹⁴⁹ NHTSA reasoned that “applying the increased civil penalty rate to completed or largely completed model years would raise serious retroactivity concerns” and would be “inappropriate to apply the adjustment to model years that could have no deterrence effect and promote no additional compliance with the law.”¹⁵⁰ Various environmental groups and a coalition of 15 states separately filed petitions for review in the U.S. Court of Appeals for the Second Circuit, challenging the 2021 interim final rule.¹⁵¹ On April 6, 2021, the Second Circuit granted the parties' motions to pause the litigation.¹⁵²

Under the CAA, manufacturers that fail to comply with the GHG emissions standards are also subject to civil enforcement. The EPA Administrator and the U.S. Attorney General determine the amount of the civil penalty based on numerous factors, but it could be as high as \$37,500 per vehicle per violation.¹⁵³ Due to the existing credit flexibilities, EPA has never determined any manufacturer to be out of compliance with the light-duty vehicle GHG emissions standards.

statutes. NHTSA, “Civil Penalties: Final Rule,” 81 *Federal Register* 95489, December 28, 2016.

¹⁴⁶ NHTSA, “Civil Penalties: Final Rule,” 84 *Federal Register* 36007, August 26, 2019.

¹⁴⁷ *New York v. NHTSA*, 974 F.3d 87, 101 (2d Cir. 2020).

¹⁴⁸ *Ibid.*

¹⁴⁹ NHTSA, “Civil Penalties: Interim Final Rule, Request for Comments, Response to Petition for Rulemaking,” 86 *Federal Register* 3016, 3019, January 14, 2021.

¹⁵⁰ *Ibid.* at 3020.

¹⁵¹ Petition for Review of a Final Rule of the NHTSA, *New York v. NHTSA*, No. 21-339 (2d Cir. Feb. 16, 2021); Petition for Review of a Final Rule of the NHTSA, *Natural Res. Def. Council v. NHTSA*, No. 21-139 (2d Cir. Jan. 25, 2021); Petition for Review, *Tesla, Inc. v. NHTSA*, No. 21-593 (Mar. 16, 2021). The court consolidated these cases into the lead case, *Natural Res. Def. Council v. NHTSA*, No. 21-139. Order, *Natural Res. Def. Council v. NHTSA*, No. 21-139 (2d Cir. Apr. 6, 2021).

¹⁵² Order, *Natural Res. Def. Council v. NHTSA*, No. 21-139 (2d Cir. Apr. 6, 2021).

¹⁵³ 42 U.S.C. §7524.

Table 4. MY 2019 Manufacturer Fuel Economy and GHG Values

(Data are projected. Values show performance data after the two-cycle test and, in most instances, after adjustments,* but before the manufacturer’s use of compliance flexibilities.)

Manufacturer	Fleet	CAFE Standard (mpg)	CAFE Performance (mpg)	GHG Standard (g/m)	GHG Performance (g/m)
BMW *	IPC	40.7	36.1	229	234
	LT	31.1	29.8		
Daimler/Mercedes *	DPC	40.9	35.6	231	282
	IPC	39.8	32.5		
	LT	31.7	28.7		
Fiat Chrysler	DPC	39.3	31.0	275	303
	IPC	41.8	33.0		
	LT	29.9	28.1		
Ford	DPC	41.0	36.6	272	280
	IPC	46.1	42.9		
	LT	28.4	27.3		
General Motors	DPC	41.1	36.9	265	282
	IPC	45.1	43.5		
	LT	28.7	27.1		
Honda	DPC	41.8	45.0	227	212
	IPC	43.9	43.1		
	LT	32.1	33.3		
Hyundai	IPC	41.7	38.1	200	223
	LT	32.8	26.8		
Jaguar Land Rover	IPC	39.1	33.0	274	274
	LT	31.5	29.4		
Kia	IPC	42.2	41.5	218	226
	LT	32.9	30.8		
Mazda	IPC	42.8	39.1	223	242
	LT	33.6	33.9		
Mitsubishi	IPC	45.3	45.0	210	212
	LT	35.9	35.7		
Nissan *	DPC	42.2	42.2	225	241
	IPC	41.8	39.1		
	LT	31.1	27.7		
Subaru *	IPC	43.2	37.2	234	222
	LT	34.6	36.6		

Manufacturer	Fleet	CAFE Standard (mpg)	CAFE Performance (mpg)	GHG Standard (g/m)	GHG Performance (g/m)
Tesla	DPC	39.7	762.7	214	-236
Toyota	DPC	41.4	44.9	239	247
	IPC	42.0	43.6		
	LT	31.3	29.7		
Volkswagen	DPC	41.1	41.5	233	235
	IPC	42.7	40.7		
	LT	31.8	30.5		
Volvo	IPC	38.8	35.2	264	254
	LT	31.8	32.8		

Sources: CRS, from NHTSA, “Manufacturer Projected Fuel Economy Performance Report,” October 11, 2019, Table 1; EPA, “The 2020 EPA Automotive Trends Report: Greenhouse Gas Emissions, Fuel Economy, and Technology Since 1975,” January 2021, Table 5.11.

Notes: CAFE values in miles per gallon (mpg); GHG values in grams per mile (g/m). CAFE compliance is divided into three fleets: domestic passenger cars (DPC), import passenger cars (IPC), and light trucks (LT); GHG compliance is not divided. GHG performance values—and most CAFE performance values—are after fleet adjustments but before credit banking, borrowing, trading, or transferring by manufacturer. A higher CAFE performance value than CAFE standard value is in compliance; a lower GHG performance value than GHG standard value is in compliance. Values listed in *italics* show performance data that do not meet the standards after the two-cycle test and adjustments, but before the manufacturer’s use of compliance flexibilities. Manufacturers may be in compliance for one program but out of compliance for the other due to the classification of fleets and the differences in the programs’ adjustments.

* The MY 2019 CAFE performance data for BMW, Daimler/Mercedes, Nissan, and Subaru, as reported by NHTSA, have not been adjusted for air-conditioning efficiency improvements, other “off-cycle” technologies, and advanced full-size pickup technologies.

Table 5. GHG Credit Balances After MY 2019

Manufacturer	Total Credits Carried Forward to MY 2020 (Metric Tons)
Fiat Chrysler	47,069,423
Honda	41,544,806
Toyota	35,440,768
Subaru	20,701,475
General Motors	19,463,876
Nissan	19,451,210
Hyundai	12,292,480
Ford	9,267,929
Mazda	8,943,710
BMW	6,013,161
Volkswagen	2,629,693
Kia	2,488,012
Mitsubishi	2,039,380
Volvo	1,283,407
Daimler/Mercedes	304,261
Ferrari	111,994
Karma Automotive	56,011
Tesla	52,161
Jaguar Land Rover	48,478
Aston Martin	16,842
BYD Motors	5,568

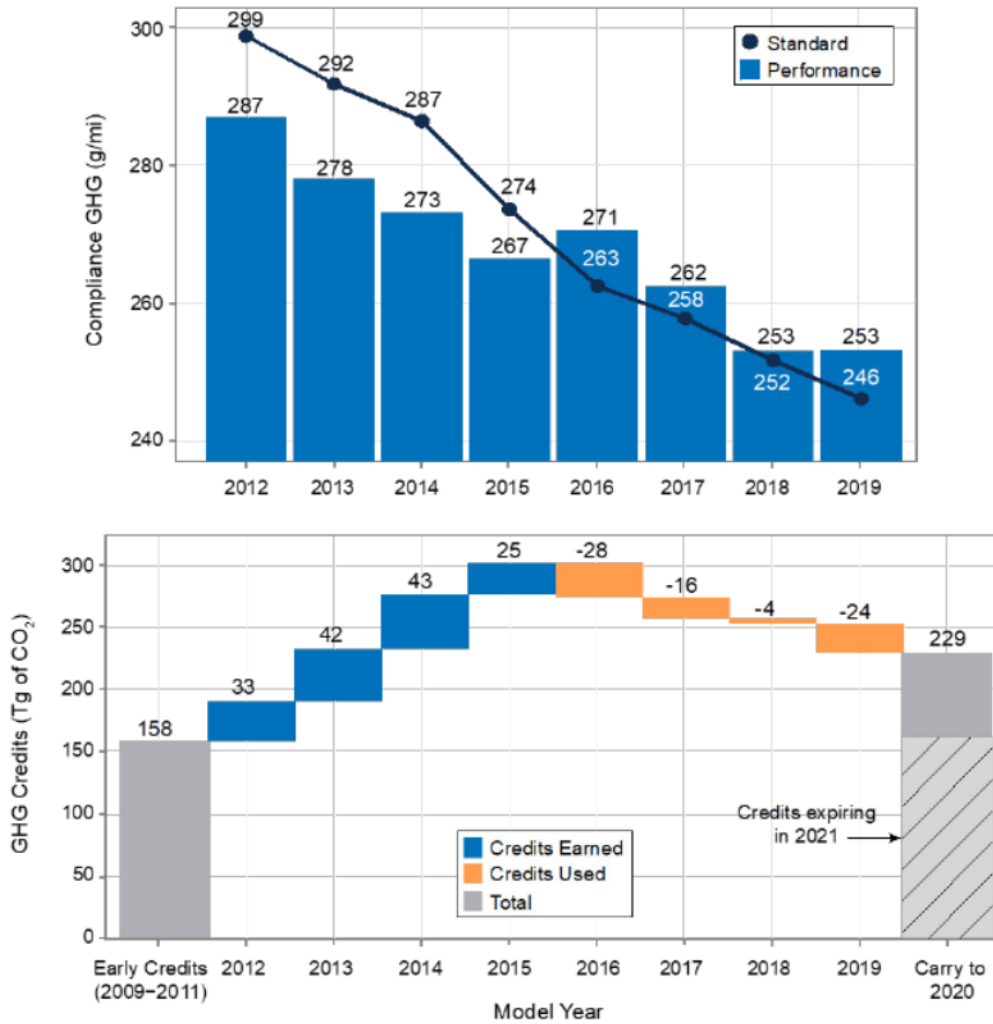
Source: CRS, from EPA, “The 2020 EPA Automotive Trends Report: Greenhouse Gas Emissions, Fuel Economy, and Technology Since 1975,” January 2021, Table 5.19.

Notes: A GHG credit is earned for each megagram (Mg, or metric ton) of CO₂-equivalent saved relative to the standard as calculated for the projected lifetime of the vehicle. EPA estimates the lifetime of a passenger car to be 14 years and the lifetime of a light truck to be 16 years. Accordingly, outstanding credits for all manufacturers carried forward to MY 2020 are equivalent to 229 million metric tons CO₂-equivalent saved. For comparison, CO₂-equivalent emissions from all on-road passenger cars and light trucks in the United States in 2017 were 1,054 million metric tons (EPA, “Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2017,” April 11, 2019, Table 3-13).

EPA calculates credit balances to include early credits earned 2009-2011, net credits earned 2012-2019, and credits purchased; less credits expired, credits forfeited, and credits sold.

Some companies on the list produced no vehicles for the U.S. market in the most recent model year, but the credits generated in previous model years continue to be available. Manufacturers can offset current deficits using future credits (either generated or acquired within three years) to determine final compliance.

Figure 6. Industry GHG Credit Generation and Use



Source: EPA, “The 2020 EPA Automotive Trends Report: Greenhouse Gas Emissions, Fuel Economy, and Technology Since 1975,” January 2021, Figure 5-17.

Notes: One teragram carbon dioxide (Tg CO₂) is equivalent to one million metric tons (MMT).

What Is Meant by “Harmonizing” or “Aligning” the Standards?

Many auto manufacturers and industry stakeholders have argued that the CAFE and GHG emissions standards are intended to be a joint set of rules that would allow auto manufacturers to comply with both programs through a single unified fleet. In practice, however, differences in the test procedures, flexibilities, and credit systems used by NHTSA and EPA have created the possibility that a manufacturer’s fleet may be in compliance with one agency’s program but not the other’s. Although the agencies have acted to integrate the standards, differences remain. Some stakeholders argue for statutory or regulatory changes to further integrate—or what they refer to as “harmonize” or “align”—the standards.

Table 6 outlines a selection of the differences between the federal programs. Many of NHTSA’s requirements are statutory; thus, many potential adjustments to NHTSA’s CAFE program would require legislation.

Lawmakers have introduced bills in the 114th, 115th, 116th, and 117th Congresses to address some of the statutory limitations of the CAFE program vis-à-vis the GHG program. For example:

- S. 667 (117th) would revise Chapter 329 of the *United States Code* for certain vehicles that are able to operate on something other than petroleum-based fuel, such as electric vehicles.
- S. 581 (116th) would have revised Chapter 329 of the *United States Code* for certain vehicles that are able to operate on something other than petroleum-based fuel, such as electric vehicles and to extend NHTSA’s credit banking period.
- H.R. 431 (116th) would have repealed Title 49, Chapter 329, of the *United States Code*.
- S. 1273/H.R. 4011 (115th) would have amended Title 49, Chapter 329, of the *United States Code* to extend NHTSA’s credit banking period, ease the limits on credit trading and transferring between fleets, and allow for Phase 1 off-cycle credits.
- S.Amdt. 3251 to S. 2012 (114th) would have modified the calculation of fuel economy for gaseous fuel, dual-fueled automobiles under Title 49, Chapter 329, of the *United States Code*.

Table 6. Selected Differences Between NHTSA’s CAFE and EPA’s GHG Programs
(citations to the U.S.C. and C.F.R. are provided where appropriate)

Item	NHTSA CAFE Program	EPA GHG Program
Authority	EPCA, EISA	CAA
Citations	49 U.S.C. §§32901-32919; 49 C.F.R. Parts 523, 531, 533, and 600	42 U.S.C. §§7521-7554; 40 C.F.R. Parts 85, 86, and 600
Stated Purpose	“To increase domestic energy supplies and availability; to restrain energy demand; [and] to prepare for energy emergencies” (EPCA 1975)	To prevent the “emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines, which ... cause, or contribute to ... air pollution which may reasonably be anticipated to endanger public health or welfare” (CAA 1970)

Item	NHTSA CAFE Program	EPA GHG Program
Considerations	EPCA requires that NHTSA establish separate passenger car and light truck standards (49 U.S.C. §32902(b)(1)) at “the maximum feasible average fuel economy level that it decides the manufacturers can achieve in that model year” (49 U.S.C. §32902(a)), based on the agency’s consideration of four statutory factors: “technological feasibility, economic practicability, the effect of other motor vehicle standards of the Government on fuel economy, and the need of the United States to conserve energy” (49 U.S.C. §32902(f))	CAA requires that EPA consider issues of technical feasibility, cost, and available lead time. Standards under Section CAA 202 (a) take effect only “after providing such period as the Administrator finds necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period” (42 U.S.C. §7512 (a)(2))
Compliance Categories	“Passenger car” and “light truck” as defined in 49 C.F.R. Part 523	“Light-duty vehicle,” “light-duty truck,” and “medium-duty passenger vehicle” as defined in 40 C.F.R. §86.1803-01
Control	Fleet average fuel economy as measured by vehicle miles per gallon (49 U.S.C. §32901(11))	Fleet average CO ₂ -equivalent ^a emissions as measured by grams per mile
Duration	Five years (49 U.S.C. §32902(b)(3)(B)); MYs 2017-2021 and the proposal of nonfinal “augural” standards for MYs 2022-2025 under Obama Administration’s Phase 2 Rule. MYs 2022-2026 under the SAFE Vehicles Rule	EPA’s duration is unlimited under the CAA. MYs 2017-2025 under Obama Administration’s Phase 2 Rule. MYs 2022-2026 under the SAFE Vehicles Rule
Minimum Standard	Minimum Fleet Standard: 35 mpg by MY 2020 (49 U.S.C. §32902(b)(2)(A)); Minimum Domestic Passenger Car Standard: 27.5 mpg or 92% of the average fuel economy of the combined domestic and import passenger car fleets in that model year, whichever is greater (49 U.S.C. §32902(b)(4))	None
Cost of Non-compliance	Fines can be paid to satisfy compliance. Fee of \$5.50 per 0.1 mpg over the standard, per vehicle (49 U.S.C. §32912); starting 2019, \$14 per 0.1 mpg over the standard (NHTSA, “Civil Penalties: Final Rule,” 81 <i>Federal Register</i> 95489, December 28, 2016)	Civil enforcement; unknown penalty, but could be as high as \$37,500 per vehicle per violation of the CAA (42 U.S.C. §7524)
Credits Definition of Credit	0.1 mpg above manufacturer’s required mpg standard for fleet (49 U.S.C. §32903(d))	1.0 megagram (or metric ton) of CO ₂ -equivalent as estimated over the lifetime of the vehicle below the manufacturer’s standard

Item	NHTSA CAFE Program	EPA GHG Program
Compliance Categories	Domestic Passenger Cars; Import Passenger Cars; Light Trucks (49 U.S.C. §32903(g)(6)(b))	Passenger Cars; Light Trucks
Credit Banking	Five-year banking period (49 U.S.C. §32903(a)(2))	Five-year banking period with the exception that credits earned between MYs 2010-2016 can be carried forward through MY 2021
Credit Borrowing	Three-year carryback period (49 U.S.C. §32903(a)(1))	Three-year carryback period
Limits	Limits on credits that can be transferred between compliance fleet categories; adjustment factors placed on traded or transferred credits to preserve "fuel savings" over the vehicle miles traveled (VMT) of the vehicle (49 U.S.C. §32903(f-g))	No limits on credits transferred between compliance categories; VMT calculation incorporated into definition of credit
Provisions for Alternative-Fueled Vehicles	Credits for ethanol and methanol fuels; electricity use in electric vehicles is converted to "equivalent gallons of gasoline" and only 15% of that is counted for compliance (49 U.S.C. §§32905-32906)	Allows manufacturers to count each alternative-fueled vehicle as more than a single vehicle—multipliers range from 1.3 to 2.0 depending on the extent of alternative fuel used and the model year; emissions from battery electric vehicles assumed to be zero
Exemptions	Secretary of Transportation's decision on exemptions for manufacturers with limited production lines of fewer than 10,000 passenger automobiles in the model year two years before the model year for which the application is made (49 U.S.C. §32902(d)); generally, fines can be paid to satisfy compliance	Temporary Lead-Time Allowance Alternative Standards for manufacturers with limited product lines through MY 2015

Sources: CRS, from EPA and NHTSA, "2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards; Final Rule," 77 *Federal Register* 62624, October 15, 2012; EPA and NHTSA, "The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks; Final Rule," 85 *Federal Register* 24174, April 30, 2020; 49 U.S.C. §§32901-32919; 42 U.S.C. §§7401-7671q; 49 C.F.R. Parts 523, 531, 533, and 600; and 40 C.F.R. Parts 85, 86, and 600.

- a. Although CO₂ is the primary GHG, other gases, such as methane (CH₄) and fluorinated gases (e.g., air conditioner refrigerants), also act as greenhouse gases. The calculations of the weighted fuel economy and carbon-related exhaust emissions values are provided for in 40 C.F.R. §600.113-12, and require input of the weighted grams/mile values for CO₂, total hydrocarbons (HC), carbon monoxide (CO), and, where applicable methanol (CH₃OH), formaldehyde (HCHO), ethanol (C₂H₅OH), acetaldehyde (C₂H₄O), nitrous oxide (N₂O), and methane (CH₄). Reductions in other (i.e., nontailpipe) GHG emissions are captured in adjustments made to the compliance standards based on the manufacturer's use of flex-fuel vehicle, air-conditioning, "off-cycle," and CH₄ and N₂O deficit credits.

Other differences between NHTSA's CAFE and EPA's GHG standards stem from the agencies' regulatory interpretations. These differences could potentially be addressed through new rulemaking. In June of 2016, the Alliance of Automobile Manufacturers and the Association of

Global Automakers submitted to EPA and NHTSA a Petition for a Direct Final Rule.¹⁵⁴ The petition asked the agencies to address some of the regulatory differences between the two programs, such as the calculations and applicability of off-cycle credits, air-conditioning efficiency credits, fuel savings adjustment factors, vehicle miles traveled (VMT) estimates, and alternative-fueled vehicle multipliers.

NHTSA partially granted the petition for rulemaking on December 21, 2016, agreeing “to address the changes requested in the petition in the course of the rulemaking proceeding, in accordance with statutory criteria.”¹⁵⁵ Under the Trump Administration, NHTSA and EPA were petitioned by stakeholders to consider regulatory alignment. Most of these discussions focused on loosening the stringency of NHTSA’s statutory and regulatory requirements so that they more closely match the flexibilities under EPA’s standards. In the near term, this could serve the purpose of allowing many auto manufacturers to avoid paying compliance penalties under NHTSA’s CAFE program, as they would be allowed to account for more credits in a revised system. Greater alignment, however, could also be achieved through tightening some of EPA’s flexibilities so that they more closely adhere to NHTSA’s requirements.

What Is Meant by “Decoupling” the Standards?

As an alternative to harmonizing NHTSA’s CAFE and EPA’s GHG emissions standards, other stakeholders have proposed “decoupling,” or “creating separation” between the two sets of standards.¹⁵⁶ They argue that NHTSA faces statutory limits on technologies, timelines, and compliance flexibilities when setting standards on fuel economy, while EPA has much broader authority to reduce vehicle GHG emissions. Decoupling the programs could potentially allow EPA to be more aggressive on sector-wide emissions reductions, move more quickly on electrification and other alternative fuel strategies, and produce a longer-term set of standards to allow greater regulatory certainty for the industry.

As currently provided in EPCA and EISA, NHTSA faces statutory limits when considering technologies that improve vehicle fuel economy beyond improvements to an internal combustion

¹⁵⁴ Alliance of Automobile Manufacturers and Global Automakers, “Re: Petition for Direct Final Rule with Regard to Various Aspects of the Corporate Average Fuel Economy Program and the Greenhouse Gas Program,” June 20, 2016, https://www.epa.gov/sites/production/files/2016-09/documents/petition_to_epa_from_auto_alliance_and_global_automakers.pdf. Specifically, the petition asked the agency to consider the following: (1) include off-cycle credits in NHTSA’s CAFE calculation for MYs 2010-2016; (2) include air-conditioning efficiency credits in NHTSA’s CAFE calculation for MYs 2010-2016; (3) apply the fuel savings adjustment factor across model years within a compliance category; (4) Apply the harmonized VMT estimates from MYs 2017-2025 to MYs 2011-2016; (5) revise NHTSA credit transfer definition to be more consistent with EPA; (6) revise other restrictions on the use of credits; (7) revise the CAFE minimum domestic passenger car standard to reflect the final standard applicable to each model year; (8) revise the multiplier for battery electric, plug-in hybrid electric, fuel cell, and compressed natural gas vehicles; and (9) revise the off-cycle credit approval process.

¹⁵⁵ NHTSA, “Corporate Average Fuel Economy Standards; Credits: Proposed Rule,” 81 *Federal Register* 95553, December 21, 2016.

¹⁵⁶ See, for example, Brenda Mallory, Joe Goffman, and Jennifer Macedonia, “Climate 21 Project, Transition Memo: Environmental Protection Agency,” Nicholas Institute for Environmental Policy Solutions, 2020, p. 11. “Under the Clean Air Act, EPA has the ability to encourage a bolder approach on light duty vehicle electrification in order to leap-frog incremental improvement of internal combustion engines, incorporate additional metrics, and set a long-term trajectory to zero emissions, while working with California and other key stakeholders. EPA’s Clean Air Act authority to set standards for GHG emissions from mobile sources operates independently from that of the National Highway Transportation and Safety Administration (NHTSA) under the Energy Policy and Conservation Act—and it provides EPA with greater latitude and flexibility.” It should be noted that Brenda Mallory and Joe Goffman have been appointed for positions in the Biden Administration.

engine operated on gasoline or diesel fuel. These provisions limit NHTSA’s ability to incorporate fuel economy improvements based on electrification, alternative fuel use, and off-cycle technologies:

Limitations.—In carrying out subsections (c)[amending the standards], (f)[considering maximum feasible average fuel economy], and (g)[amending the exemptions to the standards] of this section, the Secretary of Transportation—(1) may not consider the fuel economy of dedicated automobiles [“dedicated automobile” means an automobile that operates only on alternative fuel, 49 U.S.C. §32901(a)(8)]; (2) shall consider dual fueled automobiles to be operated only on gasoline or diesel fuel; and (3) may not consider, when prescribing a fuel economy standard, the trading, transferring, or availability of credits under section 32903.¹⁵⁷

Existing statutory authority also limits NHTSA from setting standards more than five years in advance,¹⁵⁸ or beyond MY 2030.¹⁵⁹

Possible scenarios for decoupling could include

1. having NHTSA continue to set CAFE standards for petroleum-fueled vehicles in coordination with EPA, but allowing EPA to require more stringent fleet-wide GHG emissions reduction improvements that would effectively require electric and other alternative-fueled vehicle penetration; or
2. having NHTSA continue to set CAFE standards that establish a “floor” for petroleum-fueled vehicle improvements, while separately allowing EPA to regulate emissions from all classes of vehicles, perhaps through the incorporation of mandates (e.g., as in California’s GHG standards and ZEV programs); or
3. having NHTSA cease setting CAFE standards after the agency is no longer required to do so by law (i.e., MY 2030 per EPCA and EISA), thus leaving EPA to promulgate vehicle GHG emissions standards independent of NHTSA for MY 2031 and beyond.

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¹⁵⁷ 49 U.S.C. §32902(h).

¹⁵⁸ 49 U.S.C. §32902(b)(3)(B) stipulates that the Secretary shall “issue regulations under this title prescribing average fuel economy standards for at least 1, but not more than 5, model years.”

¹⁵⁹ 49 U.S.C. §32902(b)(2)(B) stipulates requirements for fuel economy standards for vehicle MYs 2021 through 2030. “For model years 2021 through 2030, the average fuel economy required to be attained by each fleet of passenger and non-passenger automobiles manufactured for sale in the United States shall be the maximum feasible average fuel economy standard for each fleet for that model year,” as limited by the other provision in the section.

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