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Air and Radiation Docket  
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Washington, DC 20460

Docket Management Facility, M-30,  
U.S. Department of Transportation,  
West Building, Ground Floor, Rm. W12-140,  
1200 New Jersey Avenue SE,  
Washington, DC 20590

Attention: Docket No. EPA-HQ-OAR-2018-0283; NHTSA-2018-0067

Subject: Request for Comments – The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks

Ford Motor Company (Ford) hereby submits our response to the August 24, 2018 Notice of Proposed Rulemaking (Proposed Rule), requesting comments on the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks (Proposed Rule).

We appreciate the opportunity to comment on the Proposed Rule. This rulemaking raises economic and policy issues of great significance to the automobile industry and the nation as a whole.

Climate change is real, and Ford understands there is a pressing need to continue the ongoing effort to reduce greenhouse gas emissions from the light-duty vehicle sector. That is why we remain committed to reducing greenhouse gas emissions from every aspect of our business, including the emissions from our products. We already have charted a course for our future that includes \$11 billion of investment to put hybrid and fully electric vehicle models on the road by 2022.

At the same time, as the Proposed Rule recognizes, the nation's fuel economy and greenhouse gas standards must take into account the challenges inherent in the effort to shift the nation's vehicle fleet toward more electrified and advanced technology vehicles. Consumers decide which vehicles to purchase based on a whole host of factors, including price, performance, safety, and functionality, as well as fuel economy. Sales of electrified vehicles have not increased at rates projected by the Agencies when the 2017-2025 model year standards originally were adopted. If fuel economy and greenhouse gas standards become misaligned with consumer preferences and consumer demand, it will result in economic damage and impose adverse consequences on both consumers and the auto industry.

In light of the above, Ford approaches the Proposed Rule with the following two key goals in mind:

- We support fuel economy and greenhouse gas standards that increase year-over-year with additional flexibility to help us provide more affordable options for our customers. Quite simply, this should include the expansion of the electric vehicle (EV) multipliers (which are part of the existing framework) to further incentivize electrification nationwide.
- We seek to preserve and extend One National Program, maintaining the level of coordination that has existed between the federal government and California since the 2012 model year. The One National Program framework provides a consistent, stable regulatory environment in which to make capital-intensive investments. It is imperative that we avoid a patchwork of regulations, which would only serve to add inefficiency, regulatory burdens, and uncertainty. Prolonged litigation over fuel economy and greenhouse gas standards would be even worse.

We appreciate the efforts of the Administration to carry out the Mid-Term Evaluation process in accordance with the timing set forth in its regulations, so as to allow for meaningful stakeholder input.

The Proposed Rule identifies a range of possible alternatives for evaluation and comment. We believe that, within that general range of alternatives, there should be a basis for a solution that a substantial majority of stakeholders can support. We are committed to working with EPA, NHTSA, California, and other key stakeholders toward the goal of a renewed One National Program.

If you have any questions about the substantive comments, please contact Todd Fagerman at (313) 594-0680 or Nancy Homeister at (313) 594-1035. Thank you for your attention to these comments.

Sincerely,

A handwritten signature in black ink that reads "Bob Holycross". The signature is written in a cursive style with a long, sweeping underline.

Bob Holycross

**This document sets forth the comments of Ford Motor Company (Ford) on the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks proposal, published on August 24, 2018 [Federal Register / Vol. 83, No. 165]**

Introduction

Ford Motor Company appreciates the opportunity to provide comments on the Proposed Rule. Ford is a member of the Alliance of Automobile Manufacturers (Alliance) and supports the Alliance's comments on the proposed Corporate Average Fuel Economy (CAFE) and greenhouse gas (GHG) regulations.

Ford has long been committed to the reduction of GHG emissions and improvement in vehicle fuel efficiency. Ford has announced initiatives reflecting our commitment to fuel efficiency, electrified products, and the future of mobility, including:

- Investing \$11 billion to put 40 hybrid and fully electric vehicle models on the road by 2022
- Responsible development of the self-driving car
- The development of smart vehicles for a smart world. We are building the Transportation Mobility Cloud, an open platform that will use connected vehicles and data to support a more efficient transportation system that can reduce congestion, emissions and improve the overall quality of life

Ford's commitment to GHG reductions has long included support for meaningful motor vehicle GHG standards. Ford strongly supported the development of the "One National Program" (ONP) CAFE and GHG regulations for the 2012-2016 model years, and again for the 2017-2025 model years. Ford supported those programs primarily because they allowed us to develop and produce a single fleet of vehicles that met the requirements and goals of the Environmental Protection Agency, the National Highway Traffic Safety Administration and the California Air Resources Board, as opposed to a patchwork of regulations applying different standards to different programs.

The 2017-2025 ONP standards, which were finalized in 2012, were unprecedented. In that rulemaking, EPA and NHTSA were attempting to set standards some 13 years into the future—a much longer time period than had been applied to any previous CAFE rulemaking. Ford and the rest of the industry had concerns about the setting of hard-and-fast standards so far into the future. Manufacturers' ability to meet those standards depends on a range of factors including technology development, consumer acceptance, affordability and fuel prices—all of which are difficult to forecast over the long term. Therefore, our support for the 2017-2025 model year rules was contingent on the inclusion of provisions for a "mid-term evaluation" in which there would be a second look at the 2022-2025 model year standards to make sure they remained appropriate in light of the most up-to-date information available in 2018.

Although the Mid-Term Evaluation process was turbulent,<sup>1</sup> it was ultimately allowed to play out as intended. It provided the opportunity for meaningful stakeholder input, as well as considerable analysis by both NHTSA and EPA. It resulted in EPA's April 2 determination that the 2022-2025 model year standards were not appropriate in light of the record before EPA, and that the EPA would pursue further rulemaking in conjunction with NHTSA. The Proposed Rule is the culmination of that effort to date.

Ford has two overarching goals for the outcome of this rulemaking:

- We support CAFE and GHG standards that increase year-over-year with additional flexibility to help us provide more affordable options for our customers. Quite simply, this should include the expansion of the electric vehicle (EV) multipliers (which are part of the existing framework) to further incentivize electrification nationwide.
- We seek to preserve and extend ONP, maintaining the level of coordination that has existed between the federal government and California since the 2012 model year. The ONP framework provides a consistent, stable regulatory environment in which to make capital-intensive investments. It is imperative that we avoid a patchwork of regulations, which would only serve to add inefficiency, regulatory burdens, and uncertainty. Prolonged litigation over CAFE and GHG standards would be even worse.

We hope these are goals that the Administration and all relevant stakeholders can support and pursue. Within the context of those goals, our comments below are intended to address specific issues raised by the Proposed Rule preamble and/or the Proposed Rule that merit further discussion. These comments, which are intended to complement and supplement the Alliance's, will focus on the following items:

1. Structure of the 2021 – 2026 MY GHG/CAFE Standards
2. Consumer Acceptance and Affordability of Fuel-efficient Technologies
3. Technology Cost and Effectiveness/Modeling
4. Program Flexibilities
5. Upstream Emissions
6. NHTSA Reporting Changes
7. Vehicle Classification
8. Octane
9. Bifurcated GHG standards
10. Adverse Consequences of Litigation

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<sup>1</sup> In January 2017, EPA abruptly brought the Mid-Term Evaluation process to a premature conclusion by announcing that it had found the 2022-2025 model year standards to be "appropriate." EPA later announced its intention to reconsider that decision, ultimately leading to the April 2, 2018 determination described above. The completion of the process on the timeline set forth in the regulations was crucial to ensure that meaningful information could be submitted to the administrative record and that the agencies would have adequate time to consider all of the relevant technical inputs.

## 1. Structure of the 2021-2026 MY GHG/CAFE Standards

### Truck standards should not increase in stringency at a faster rate than car standards

The GHG/CAFE standards adopted for model years 2012-2016 set equivalent year-over-year stringency increases for the passenger car and light duty truck fleets. When preparing to adopt the regulations for model years 2017-2025, the Agencies adjusted the truck year-over-year footprint curves from 5% to 3.5% through 2020MY, while leaving cars at 5% year-over-year. This was in recognition of the core differences between passenger cars and light duty trucks, acknowledging Ford's previous comments accordingly:

*"The agencies agree with Ford (and others) that the properties of cars and trucks are different. The agencies agree with Ford's observation (and illustration) that " \* \* \* cars and trucks have different functional characteristics, even if they have the same footprint and nearly the same base curb weights. For example, the Ford Edge and the Ford Taurus have the same footprint, but vastly different capabilities with respect to cargo space and towing capacity. Some of the key features incorporated on the Edge that enable the larger tow capability include an engine oil cooler, larger radiator and updated cooling fans. This is just one of the many examples that show the functional difference between cars and trucks \* \* \*" (77 Fed. Reg. 62697)*

Going further, the Agencies previously stated that they had:

*"...underestimated the impact of the different pickup truck model configurations" in the model year 2012-2016 rule, and that the "very largest light trucks have significant load-carrying and towing capabilities that make it particularly challenging for manufacturers to add fuel economy-improving/CO<sub>2</sub>-reducing technologies in a way that maintains the full functionality of those capabilities." (76 Fed. Reg. 74919)*

Trucks are designed with greater capability to serve customer needs for off-road capability, towing, cargo capacity, and other key attributes. Therefore, it is unclear, and not explained in the Proposed Rule, why many of the proposed scenarios involve increases in the stringency of the light duty truck fleet faster than the passenger car fleet. We know of no basis for the proposition that the truck fleet is capable of faster reductions in GHG standards than the car fleet, and we are not aware of any support for this concept in any of the Agencies' analyses.

As stated above, Ford does support year-over-year increases in the stringency of CAFE and GHG standards. However, those year-over-year increases in stringency should not occur at a faster rate for the light duty truck fleet than for the passenger car fleet. Attempting to impose a heavier burden on the truck fleet than the car fleet would have adverse economic consequences for manufacturers and could have the effect of reducing choices for consumers. At a minimum, the rates of increase in the stringency of the standards should remain equivalent between passenger cars and light duty trucks.

### N<sub>2</sub>O/CH<sub>4</sub> Standards

The proposal seeks information regarding the appropriateness of the existing N<sub>2</sub>O/CH<sub>4</sub> standards in the GHG regulation. The Proposed Rule maintains the existing standards, but removes the existing regulatory flexibility that allows for an exceedance of the regulatory standard to be incorporated in to the CREE calculation as GHG emissions.

Ford supports the elimination of the CH<sub>4</sub> and N<sub>2</sub>O standards, as described in the Alliance comments. After-treatment systems designed to control key criteria pollutants (e.g., NO<sub>x</sub>, HCs), have a limited ability to reduce engine-out methane emissions, while N<sub>2</sub>O is actually produced in the catalyst. Additionally, these substances do not significantly contribute to overall vehicular GHG emissions.

Finally, without the ability to incorporate exceedances into CREE, each vehicle will need to employ hardware solutions if they do not comply. We do not believe it was EPA's intent in the original rulemaking to require additional after-treatment, with associated cost increases, explicitly for the control and reduction of an insignificant contributor to GHG emissions. Therefore, we do not support the proposal to maintain the existing N<sub>2</sub>O/CH<sub>4</sub> standards while removing the CREE exceedance pathway. Comments submitted by the Alliance provide more detailed alternative recommendations to the Proposed Rule.

## **2. Consumer Acceptance and Affordability of Fuel-efficient Technologies**

We appreciate the Agencies' careful consideration of consumer acceptance and affordability in the Proposed Rule. Consumer acceptance of vehicles equipped with fuel-efficient technologies continues to be a key driver in success of the standards. Consumers must be willing and able to pay the cost of fuel-efficient technologies; otherwise, they will keep their older, less fuel-efficient vehicles longer, which impacts CO<sub>2</sub> emissions from the in-use vehicle fleet. Low vehicle sales can also have other non-CO<sub>2</sub> impacts, such as adverse effects on employment, which is a key consideration because every direct OEM job results in 6.6 jobs<sup>2</sup> in the community.

As stated in our comments to the Draft Technical Assessment Report (TAR) and Proposed Determination, consumers face competing priorities in their purchase decisions, such as performance, safety, and price. As the Alliance has noted in their comments, in the 2017 New Vehicle Experience Survey (NVES), fuel economy ranked 24<sup>th</sup> in customer responses when customers were asked about the most important reasons for purchasing a vehicle.<sup>3</sup> Furthermore, as the standards become more stringent, fuel economy is not expected to become a more important purchase consideration. As fuel economy increases, the incremental benefit of each additional MPG to the consumer with respect to fuel savings diminishes significantly, as shown in the following chart, which was provided in our comments to the prior Proposed Determination.

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<sup>2</sup> "Contribution of the Automotive Industry to the Economies of All Fifty States and the United States." Center for Automotive Research. 2015.

<sup>3</sup> 2017 Strategic Vision New Vehicle Experience Survey (NVES).

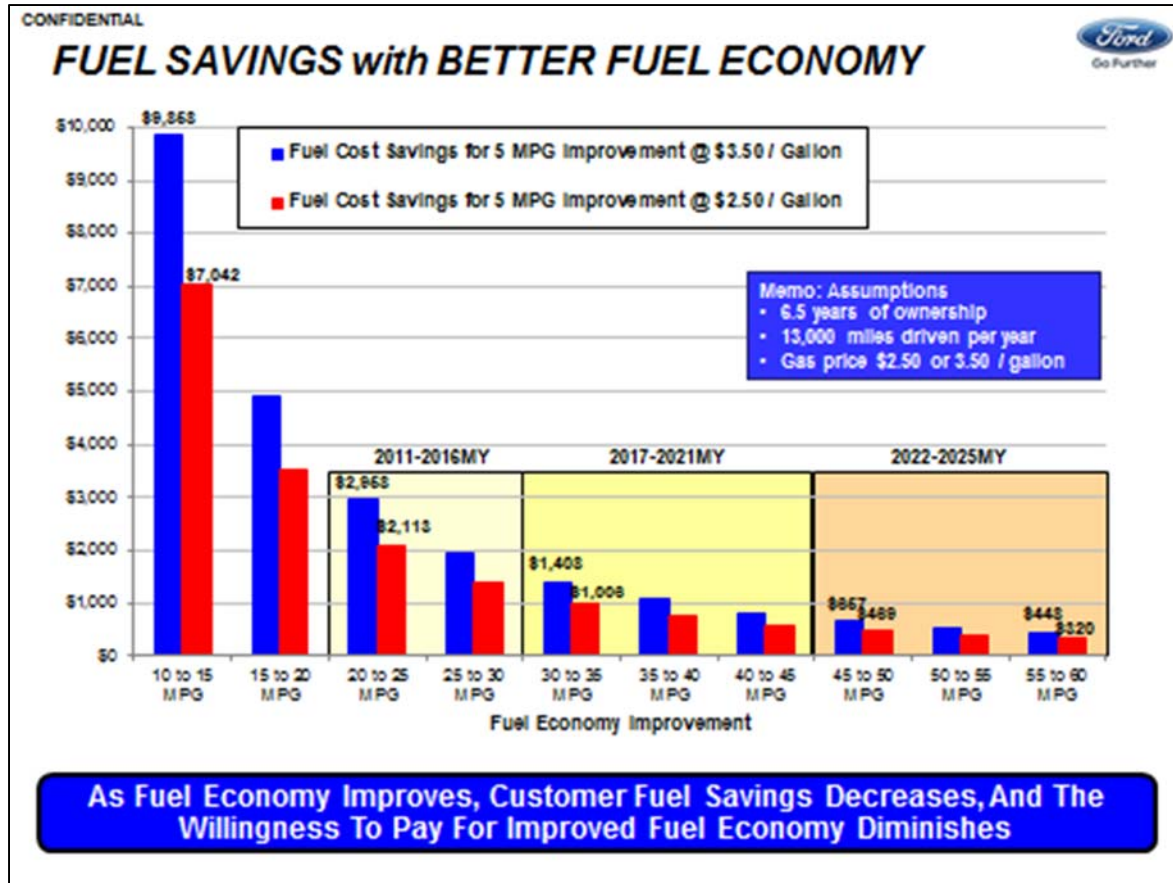


Figure 1. Fuel Economy Improvements vs. Fuel Savings

As counter-intuitive as it may seem, all mile-per-gallon increases in fuel economy are not created equal. As fuel economy ratings increase, each successive mile-per-gallon increase offers diminishing returns. At the same time, gas prices have remained relatively low, and the continuing addition of fuel economy technologies to the light-duty fleet has contributed to significant cost increases in cars and trucks. These factors have diminished the value to the consumer of fuel economy improvements, resulting in limited consumer acceptance of vehicles with lower CO<sub>2</sub> emissions and higher fuel economy.

The Draft TAR and Prior Final Determination analyses largely neglected the potential impacts of consumer acceptance on program success, concluding that there were insufficient resources and data for a proper assessment. In the Proposed Rule, the Agencies have expanded their analyses to account for consumer acceptance impacts. The Volpe model accompanying the recently published Proposed Rule has added modules to aid in understanding of how consumer acceptance can have broader consequences; namely, Volpe has added a module estimating how changes in cost impact new vehicle sales, and a module estimating how changes in vehicle sales impact vehicle scrappage. Going forward, we will continue working with Volpe to ensure their future modeling reflects the latest data and state-of-the-art methods for estimating how consumer behavior, as a result of standard changes, could impact overall NHTSA and EPA program goals.

The Alliance's comments to the Proposed Rule provide further documentation explaining how overly aggressive stringency can negatively impact consumer acceptance, in part due to affordability. In particular, the Alliance's comments reference a study by NERA Economic Consulting and Trinity Consultants titled "Evaluation of Alternative Passenger Car and Light-Duty Truck Corporate Average Fuel Economy (CAFE) Standards for Model Years 2021-2026" (econometric study), and we encourage the Agencies to refer to this document in making their final decision regarding the standards. The econometric study evaluates the market and social impacts of the augural standards and three of the eight alternatives in the Proposed Rule. The NERA modeling structure is rigorous and complex, and relies on a state-of-the-art methodology. For instance, the new vehicle sales projections are determined using a nested logit structure, which is a preferred method used extensively by economists for modeling vehicle markets, due to its ability to use past data to project future sales and segmentation trends. We urge the Agencies to review this report and its conclusions, as the Agencies finalize the regulation.

We encourage the Agencies to continue improving their understanding and consideration of consumer acceptance in the Proposed Rule and future regulations, as consumer acceptance can significantly impact the agency goals of CO<sub>2</sub> and fuel economy improvement, as well as industry employment.

### **3. Technology Cost and Effectiveness/Modeling**

Realistic technology cost and effectiveness assumptions are central to assessing the feasibility of the 2017-2025 MY CAFE/GHG regulations. The CO<sub>2</sub> reduction effectiveness attributed to specific technologies will determine the degree of advanced technology penetration needed to ensure a compliant fleet, and the resulting technology density will determine the direct and indirect manufacturing costs needed to comply. However, this picture does not fully describe the cost of compliance for manufacturers. Manufacturing costs, as typically represented in agency modeling, encompass only the costs associated with building and making available for sale the vehicles needed to comply, but they do not include the cost of actually selling a compliant fleet to customers, who do not purchase vehicles based upon fuel economy alone. Their needs and preferences include many attributes other than fuel economy, such as affordability, safety, utility, performance, and styling.

Ford recognizes and appreciates the efforts to develop a sophisticated modeling framework to estimate the technology needed to achieve a compliant fleet. However, given the demanding stringency of the 2017-2025 MY standards and the extended timeframe under consideration, care must be taken to ensure that an unwarranted optimism does not permeate the analysis. The previous analyses performed by the Agencies too often selected technology benefits from the high-end of the forecasted range, and cost from the lower-end, in part because deference was given to supplier or other third-party claims over manufacturers' estimates. Manufacturer estimates, while viewed as conservative by some, are informed by years of experience integrating new technologies into vehicle systems in a manner that avoids compromising other important attributes (NVH, utility, safety, etc.). The need to preserve these attributes often limits the actualized benefit of a new technology, an effect insufficiently considered in projections



from most non-OEM sources. The Proposed Rule analysis, however, better balances input from all stakeholders regarding the potential cost and benefits of future fuel-efficient technologies.

In summary, Ford agrees with the Alliance conclusion that the accuracy of the technology and cost modeling in the Proposed Rule has been improved considerably compared to the previous assessment. In particular, the increased level of electrification needed to comply in the analysis now better aligns with Ford estimates.

### Impact of Tier 3 and LEV III Regulations

In the previous analyses, the Agencies did not assess the impact of the criteria pollutant emission standards that were adopted subsequent to the adoption of the 2017-2025 MY Final Rule. These new requirements have increased the challenge of meeting the fuel economy and GHG targets and should be taken into consideration.

Regular-grade Octane Tier 3 Test Fuel: Previously, the projected fuel efficiency for future engine technologies was overestimated due to the use of high-octane (96+RON or higher) fuel in testing and simulations. Although this octane rating is consistent with today's Tier 2 certification fuel, this fuel will be replaced by regular-grade octane, Tier 3 E10 test fuel in the timeframe under consideration. High-octane fuel enables beneficial engine design decisions and calibration optimizations that are not available when designing powertrains to operate robustly on regular-grade octane fuel. Accordingly, using high-octane fuel for previous modeling overstated the potential fuel efficiency improvements possible for future powertrains since regular grade octane fuel will be required for compliance after 2020 MY. The Proposed Rule has corrected this oversight by updating the core engine maps using the correct, regular-grade octane test fuel.

SULEV30/Bin 30 Emissions: The ultra-low 2025 MY Tier 3 and LEV VIII emissions standards will require aggressive cold start emission strategies. These strategies consume additional fuel at start-up in order to rapidly heat the catalyst to an effective operating temperature, which degrades CO<sub>2</sub> and fuel economy performance on the FTP test. This factor was not considered previously, and Ford supports the Agencies decision to include it in this latest assessment.

### Modeling Methodology

#### Performance

Ford agrees with the comments submitted by the Alliance regarding the critical importance of appropriately accounting for vehicle performance in the model. Previous analyses attempted to quantify performance by combining test times from various performance metrics into a single quantity. Performance neutrality was then implemented by constraining engine downsizing so that this summarized measure of performance did not fall too far (i.e., 10%) below the similarly summarized performance of the baseline vehicle. This methodology does not align with product planning realities, where OEMs must ensure that each individual performance measure – and not an overall average – meets its customer's requirements. This "tolerance band"

approach also permits overall degraded performance, a condition that would be at odds with historical precedent and the competitive realities of the marketplace.

This Proposed Rule, however, takes a more realistic approach to performance modeling. As stated in the Proposed Rule:

*“The analysis resized engines to the extent that performance was maintained for the least capable performance criteria to maintain vehicle utility for that criteria...” (83 Fed. Reg. 43027, emphasis added)*

Ford supports this methodology, which better replicates OEM attribute-balancing practices. Additionally, Ford supports the inclusion of vehicle gradeability in the performance assessment.

#### Product Cadence

Ford supports the Proposed Rule modeling that uses historical observations, refresh/redesign schedule forecasts, and manufacturer-specific considerations to develop unique redesign cycles for each vehicle model. Refresh and redesign schedules strictly constrain the speed of new technology penetration within the fleet, a fundamental consideration disregarded by previous modeling that simplistically assumed the entire fleet was redesigned in two passes (2021 and 2025 MY). Additionally, upgrade cycle cadence can directly influence technology application efficiency and cost, through both design and manufacturing optimization, as well as product volume via sharing / commonality.

#### Powertrain Technologies

##### Advanced Atkinson/High-Compression Ratio Engines Technology Package (HCR1/HCR2)

Previous assessments over-estimated both the effectiveness and near-term penetration of advanced Atkinson technology powertrains. OEMs already heavily invested in alternative high-efficiency powertrain pathways (e.g., turbo-downsizing) would not be able to commit the resources needed to reach the high penetration levels previously projected for this technology. However, Ford supports the more restrained application of HCR1 in the Proposed Rule, an approach that recognizes the investment, packaging, performance and emissions factors that will limit penetration of this technology.

The effectiveness of the “futures” Atkinson package (HCR2) that includes cooled exhaust gas recirculation (CEGR) and cylinder deactivation (DEAC) is excessively high, primarily due to overly-optimistic efficiencies in the base engine map, insufficient accounting of CEGR and DEAC integration losses, and no accounting of the impact of 91RON Tier 3 test fuel. Given the speculative and optimistic modeling of this technology combination, Ford supports limiting the use of HCR2 technology to reference only, as described in the Proposed Rule.

##### Turbo Downsized Engine Packages (Turbo1 and Turbo2)

The modeled effectiveness of downsized turbocharged engine packages was previously overestimated due to the use of high-octane engine maps, optimistic friction reduction assumptions, and a failure to fully account for the effect of higher boost pressures on crevice losses, friction, and compression ratio. The degree of downsizing assumed feasible was also too aggressive, allowing maximum apparent fuel efficiency gains for modeled compliance (i.e., on the city and highway test cycles) but failing to consider the adverse effect that an “under-sized” engine can have on customer acceptance, drivability, and high speed/high load fuel consumption. The Proposed Rule analysis of turbo engines has been improved by using the correct, regular-grade test fuel for engine mapping. Ford also supports excluding 27 bar BMEP turbo / CEGR2 engine technologies and agrees with the following statement from the Proposed Rule:

*“...turbo engines with very high BMEP have demonstrated limited potential to improve fuel economy due to practical limitations on engine downsizing and tradeoffs with launch performance and drivability.” (83 Fed. Reg. 43037)*

#### Cylinder Deactivation (DEAC, ADEAC)

The Proposed Rule approach to modeling DEAC and ADEAC is sensible and appropriate. Upcoming market introductions, and most published cost and benefit projections, involve adding ADEAC to larger displacement, OHV valve engines. The Proposed Rule properly recognizes that this technology will be costlier (both piece price and investment) when applied to DOHC engines. Additionally, we believe it is appropriate to consider ADEAC separately from other engine technologies (e.g., HCR, Turbo) that also target reduced pumping losses to achieve efficiency gains.

#### Variable compression ratio engines (VCR)

Ford agrees with the Proposed Rule assessment of VCR. As a complex, high-cost technology, it is likely to be adopted only for premium / limited-market vehicles in the near future. We also agree that intellectual property protections on early implementations will further inhibit significant fleet penetration. Incorporation of VCR requires a new or highly modified engine architecture, necessitating major investment from both the engineering and manufacturing standpoints. Sharing / commonality across engine families would be greatly limited.

#### Transmission Technologies

Previous analyses had grouped unique transmission types (planetary, CVT, and DCT) into the same cost and efficiency bins, ignoring the cost and effectiveness differences of these fundamentally distinct technologies. The Proposed Rule assessment does not retain this oversimplification, and instead separately models “20 transmissions, with explicit assumptions about gear ratios, gear efficiencies, gear spans, shift logic, and transmission architecture.” In addition to improving the capability of the modeling, this approach vastly improves the transparency of the modeling assumptions.

### Electrified Powertrain Technologies

Ford supports the Alliance comments on the modeling of electrified vehicles in the Proposed Rule. In particular, we support the use of separate cost and benefits modeling for P2 and power-split strong hybrid technologies. Additionally, the modeling better reflects market realities by recognizing that manufacturers cannot simply pass on the entire incremental costs of hybrid, plug-in hybrid, and battery electric vehicles to the customers.

### Load Reduction – Mass, Aerodynamics and Tires

#### Mass Reduction

Ford supports the Agencies' decision to exclude from consideration mass reduction studies that are misaligned with tear-down studies, confidential business information, or other recognized sources. For example, a study included in the previous determination suggested that the first 7-10% of mass reduction could be accomplished with "zero" or negative cost, which is a gross underestimation of industry investment and material costs associated with any weight reduction.

Ford also supports the removal of previously applied modeling rules that disallowed the mass reduction technology pathway for certain vehicle classes since this restriction was not supported by an adequate technical justification.

#### Aerodynamics

Ford supports the Alliance comments on the aerodynamic improvement modeling in the Proposed Rule. Potential aerodynamic reductions are constrained by many factors such as consumer needs and preferences regarding vehicle styling, vehicle utility, and interior space. These are major factors considered by customers when comparing competing vehicles; the failure of a manufacturer to deliver in these areas can lead to the production of non-competitive, poor-selling vehicles. The Proposed Rule analysis recognizes some of these constraints by considering frontal area and body style as "utility factors" and requiring that aerodynamic improvements come from reductions in Coefficient of Drag ( $C_d$ ) and not from reductions in frontal area. The analysis also recognizes that the potential for reducing aerodynamic drag differs among the various body styles / vehicle classes. For example, limiting the application of AERO20 on pick-up trucks is appropriate given the high inherent form drag associated with this challenging aerodynamic profile. Additionally, the baseline  $C_d$  for pick-ups properly recognizes that these vehicles already include many advanced-level aerodynamic technologies.

Finally, the use of actual data (manufacturer confidential information or other sources) in the model to better characterize the aerodynamic improvements already incorporated into the baseline fleet is a substantial improvement over previous analyses that either assumed no aero improvement due to insufficient data, or attempted to infer  $C_d$  from the road load coefficients. This last method is not sufficiently accurate for a vehicle-level determination since the

aerodynamic component of the road load coefficients is inextricably confounded with tire, transmission, and other parasitic losses. An accurate assessment of the current technological state of the baseline fleet is critical to ensuring that the benefits of technological improvements are not “double-counted” in the modeling.

#### Tires

Ford supports the Alliance comments on low rolling resistance (ROLL) tire technology modeling. The Proposed Rule analysis appropriately limits the application of this technology where it would be infeasible or be at odds with the vehicle’s intended function. For example, restricting the application of ROLL15 and ROLL20 for high-performance vehicles is reasonable. Additionally, the accuracy of the baseline fleet assessment has been considerably improved by the use of actual tire rolling resistance data.

#### **4. Program Flexibilities**

The EPA and NHTSA compliance programs currently employ a number of flexibilities and incentives that can facilitate manufacturers’ efforts to meet GHG and fuel economy requirements. Flexibilities have provided benefit for implementing technologies whose value is not adequately captured during 2-cycle compliance testing, while the incentives have spurred development of advanced technologies that have the potential to lead to greater GHG reductions and fuel economy improvements in the long term. These pathways allow manufacturers to meet compliance requirements while preserving consumer choice, prompting additional technology development, and maintaining flexibility to accommodate future economic climates and an ever changing consumer market. Ford supports the current flexibilities and incentive programs, and encourages the Agencies to maintain and expand upon them to support the accelerated adoption of advanced technologies. Ford supports the positions detailed in the comments submitted by the Alliance and supplements those comments with the following discussion.

##### Incentives for Advanced Technology Vehicles:

The production volume multipliers for advanced technologies, including battery electric, plug-in hybrid electric, fuel cell, and natural gas vehicles, were created as a method to spur the development and deployment of these advanced technologies. When the rules were adopted in 2012 MY, EPA stated:

*“The incentives are expected to promote increased application of these advanced technologies in the program’s early model years, which could achieve economies of scale that will support the wider application of these technologies to help achieve the more stringent standards in MYs 2022–2025.” (77 Fed. Reg. 62628)*

Plug-in electric vehicles, to this day, are still only a minor share of the new vehicle sales. Although sales are increasing each year, in 2017 total sales of PHEV, BEV and FCEVs were just under 200,000 units, while total industry sales were about 17.25 million. It is clear that sales of these products needs to grow to meet the national goals for GHG and fuel consumption reduction.

Even with the current incentives available to promote manufacturers to develop these vehicles, the technology cost, national infrastructure availability, and customer acceptance has inhibited growth in the market share of these advanced technologies. The slow growth in sales of vehicles with these technologies is clear evidence that there is continuing market resistance to EVs and PHEVs; therefore, incentives are still needed. Ford strongly supports, at minimum, the continued application of the original 2019 MY values for the advanced technology multipliers (2.0 BEV/FCEV, 1.6 PHEV). However, we believe that higher incentives may be necessary to spur the growth of these advanced technology vehicles and encourage investment and marketing of these vehicles. We recommend that EPA consider the strategy used in developing the ATV multipliers for the heavy-duty vehicle fleet for opportunities to revise these multiplier values.

Ford also requests NHTSA reexamine its past interpretation on the applicability of these incentives and consider accepting these benefits as part of the CAFE program as they have done with other EPA programs such as A/C Efficiency, Off-Cycle, and Full Size Pick-up flexibilities and incentives to ensure continued alignment with GHG and CAFE fleet stringency increases.

*Advanced Technology Incentives for Large Pick Ups:*

The Agencies have previously recognized that the standards will be challenging for large vehicles, including full-size pickup trucks, that are often used as work vehicles – both commercially and in personal use. EPA and NHTSA included a credit provision for manufacturers that hybridize a significant number of their full-size pickup trucks, or use other technologies that comparably reduce CO<sub>2</sub> emissions and fuel consumption. The Agencies' goal was to incentivize the market penetration of "game changing" technologies for pickups and these credits can be instrumental to support this goal. However, to date no manufacturer has yet claimed these credits. This reflects the difficulty of implementing electrification on this class of vehicles, combined with the challenge of ensuring compliance with the minimum sales thresholds necessary to receive the credits.

Ford supports the continuation of this incentive through all model years of the program, and additionally requests that the Agencies consider modifying the program to help it more effectively promote advanced technologies. This is possible, at least in part, by removing or greatly reducing the sales thresholds currently found in the rules. These thresholds serve no purpose other than to deter the generation of otherwise valid technologies. A manufacturer that can only implement electrification technology on a small number of full-size pickups may not receive any credit due to the low volume, but this can be a stepping stone to larger programs with more benefits in future model years. The production volume cap also tends to penalize large volume manufacturers; for example, Ford would have to produce and sell over 60,000 F-150 pick-up trucks to claim the credit, while some of our competitors would only have to find customers for 2,000 advanced technology trucks, or fewer, to claim that credit that provides the same fleet percent improvement.

*Connected and Autonomous Vehicles:*

Ford is supportive of credits for future connected and autonomous vehicles. Autonomous vehicles are considered the future of personal mobility, with many manufacturers announcing plans to release autonomous capable vehicles in the near term. These vehicles have the potential to not only

provide meaningful real world GHG and fuel economy benefits, but also true societal benefit for the public good by providing transportation to those who would otherwise not have access. These vehicles should be incentivized as the true benefit will be further realized as more and more vehicles enter the roadways and are deployed in volume. There are a number of early studies indicating the benefit of connected and autonomous vehicles, but there are also many questions that arise due to the speculative nature based on early development. Ford looks forward to engaging with the Agencies to resolve the logistical issues related to compliance testing as well as determine the appropriate level at which to incentivize these advanced technology vehicles.

A/C Efficiency Credits:

The Mobile Air Conditioner (MAC) credits have proven to be a successful source of fuel consumption and GHG emission reduction. The program has proven to be effective by increasing the implementation rate of many MAC efficiency technologies that result in real world reductions that may otherwise not have been achieved. However, we believe further improvements can be made with regards to the implementation of this program, regarding the future testing (i.e., AC17 testing) requirements as well as reconsideration of the credit caps to continue to allow for and incentivize future technology development in this space.

Off-Cycle:

The Agencies' inclusion of the off-cycle technology program has provided meaningful incentives to encourage the development of technologies that have resulted in significant on-road reductions of fuel consumption and GHG emissions. Ford supports the continuation of this program. However, we believe there are several opportunities to improve the process that would encourage further development and deployment of the technologies that provide customer value in fuel savings.

For example, the current approval process for "non-menu" technologies has not functioned as envisioned when the rules were put in place in 2012. The process is prolonged—taking well over a year in many instances—and, in our view, it has delivered inconsistent results. The uncertainty associated with the approval process can delay, or even stall the deployment of these technologies. Further, the inability to gain approval for technologies under development discourages manufacturers from pursuing technologies where an assurance of benefit is necessary to justify R&D costs necessary for technology deployment

The approval process should be improved to provide for greater certainty and faster decision-making. Expanding the list of "menu" technologies would be one way to do this. For "non-menu" items, the rules should set forth objective criteria for earning credits, and as well as clear timelines for passing through the process and reaching a decision. We stand ready to work with EPA on approaches for process improvement.

We further support improvement in the credit reporting process, largely associated with direction that came from the Agencies through post-regulatory guidance. For example, reporting "thermal control" technology credits on a "per VIN" basis to ensure that individual vehicles do not exceed the "thermal control" credit caps creates a reporting burden that is misaligned with the current reporting structure, and creates enormous complexity and unnecessary workload. The original rulemaking process gave no

indication that that was the regulatory intent, and therefore industry was not given the appropriate regulatory pathway to comment on this onerous interpretation. The reporting should be implemented at the fleet level as is done with all other reporting, but should also remain flexible as many of these technologies are implemented based on trim level alone rather than historical reporting levels.

## **5. Upstream Emissions**

Ford supports the continuation of the 0.0 GHG gram/mile accounting of the electric drive portion for battery electric and plug-in hybrid electric vehicles when determining fleet compliance with the GHG standards. In the Proposed Rule, the Agencies have not proposed changes to the upstream emission accounting requirements that require manufacturers to take responsibility for emissions created by electricity generation. Rather, the Agencies characterize 0.0 GHG gram/mile upstream accounting to be an “incentive” that encourages adoption of alternative fuel vehicles, similar to how electric vehicle multipliers encourage adoption of electrified products. The Agencies did state, however, that they are open to comments on whether such incentives should be allowed to expire, and how flexibilities might be amended, revised, or deleted. We recommend that EPA either amend their regulation to set upstream emissions at 0.0 GHG gram/mile indefinitely, or remove upstream emissions from the compliance calculation altogether.

Unlike tailpipe CO<sub>2</sub> emissions, upstream CO<sub>2</sub> emissions are outside of the control of the automotive industry, and therefore do not belong in our industry’s regulations. The Clean Air Act Section 202(a) gives EPA authority to set “standards applicable to the emission of any air pollutant *from* any class or classes of new motor vehicles or new motor vehicle engines.” Upstream emissions are not emissions “from” vehicles or engines, and therefore should not be included in compliance calculations. Not accounting for upstream emissions is not an “incentive” and should not be characterized as such. The accounting of vehicle emissions under the Clean Air Act should be based on vehicle testing conducted in accordance with EPA regulations, and not on external factors having nothing to do with the vehicle itself.

Ford therefore recommends that upstream emissions should not be part of the compliance calculations for alternative technology vehicles. We also support the comments provided by the Alliance, which raise additional issues regarding EPA’s authority to include upstream emissions in a vehicle regulation.

## **6. NHTSA Reporting Changes**

The newly proposed NHTSA reporting template, and associated timing, are not workable and need to be revised. The proposal to begin using this reporting template for the 2019 MY is extremely aggressive and does not provide manufacturers with adequate lead time to adjust. Additionally, we believe there are a number of practical issues with the proposed reporting template that are not aligned with current reporting requirements. Similar information is already submitted to the EPA in “.xml” format through



their EV-CIS system. In order to improve harmonization between the Agencies, we request that NHTSA align with EPA's reporting format and accept information currently submitted in ".xml" format.

Furthermore, much of the detail within the template, as described in the proposal, is over and above that needed to determine compliance. Many of the detailed reporting requirements are outdated, have no bearing on compliance assessments, and are misaligned with the current reporting structure, which is dictated by model type index. We also implore NHTSA to reexamine the required submission methods and reconsider accepting electronic submissions. Submitting data on a CD through the mail is neither efficient nor the most secure method available for protecting confidential business information. There are better avenues available, such as secured email or online portals similar to EPA's Central Data Exchange, which exist to submit confidential data including those that allow for password protecting the submitted data.

## **7. Vehicle Classification**

The Proposed Rule requests comment on vehicle classification issues. Ford supports comments by the Alliance recommending that 2WD SUVs and CUVs be reclassified back into the truck fleet, where they had been placed prior to the 2011 MY. The Alliance proposes to accomplish this by adding new language to 49 CFR 523.5(a), a proposal which we support. We believe this could also be accomplished by simply reinstating NHTSA's past interpretation of the existing regulatory language.

Under NHTSA's previous interpretation of the CAFE law and regulations, if an SUV was offered with 4-wheel-drive and 2-wheel-drive variants, both variants were allowed to be classified as light duty trucks as long as they met the dimensional criteria for off-road vehicles in 49 CFR 523.5(b)(2). In setting CAFE standards for 2011 MY,<sup>4</sup> NHTSA announced that it would "tighten the coverage of its regulatory definition of 'light truck' to ensure that 2 wheel drive (2WD) versions of an SUV are not classified as light trucks..."<sup>5</sup> This change, which was characterized by NHTSA as a "clarification" of its rule, resulted in a reclassification of some 1.5 million 2WD SUVs from the truck fleet to the car fleet beginning in the 2011 MY. In our view, the revised interpretation, which has placed an added burden on truck fleet compliance, was not warranted.

When an SUV is designed to meet the "off-road-capable" definition in NHTSA's rules, it must have a high running clearance and/or axle clearance and meet other dimensional criteria. The high-clearance requirement, while beneficial for off-road operation, also creates an aerodynamic penalty—vehicles that sit high off the ground have higher aerodynamic drag than vehicles designed to sit lower to the ground, other things being equal. Thus, vehicles subject to the high-clearance requirement face a greater challenge achieving higher fuel economy standards.

In the U.S. SUV market, there is consumer demand for both 2WD and 4WD SUVs, so manufacturers virtually always offer SUVs in both versions. Ford's 2WD versions, which are consistently more affordable than the 4WD versions, offer the same towing and load hauling capability as their 4WD

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<sup>4</sup> 74 FR 14196 (March 30, 2009).

<sup>5</sup> 74 FR at 14419.

counterparts. They also have the same road load challenges of weight and aerodynamics as the 4WD versions. In short, the 2WD variants are designed to be light-duty trucks, but under the current classification rules they are forced into the passenger car fleet simply because the purchasers chose the more affordable drivetrain.

We believe the intent of the regulation was to allow manufacturers to classify as trucks all vehicles with truck-like characteristics. 2WD SUVs are designed to meet the dimensional and durability requirements of off-road-capable vehicles. Under today's rules, however, the consumer's drivetrain selection is often the sole factor in determining whether a given SUV goes into the truck fleet or the car fleet. In our view, this approach fails to take into account the design of 2WD SUVs and the realities of the U.S. vehicle market. In so doing, it imposes unwarranted burdens on truck fleet compliance obligations.

For many years, the language "has 4-wheel drive" in 49 CFR 523.5(b)(1)(i) was understood by NHTSA and the regulated community to mean "is available with 4-wheel drive." That is a reasonable interpretation of the rule, and one that was previously accepted by NHTSA.<sup>6</sup> In light of the factors described above, we think it is the *best* interpretation of the rule.<sup>7</sup> We urge the Agencies to reconsider the current classification rules for 2WD SUVs in light of the factors highlighted above and the growing share of these vehicles in the U.S. market.

## **8. Octane Rating**

EPA requested comment regarding if and how EPA could support the production and use of higher octane gasoline consistent with Title II of the Clean Air Act. The comments submitted by the Alliance provide more detail on these specific issues. Ford concurs with those comments and supports increasing the marketplace octane rating in the U.S. to a minimum of 95 Research Octane Number (RON).

Ford subscribes to the global gasoline specifications contained in the Worldwide Fuel Charter (WWFC). The Fifth Edition of the WWFC (2013) specifically outlines the use of minimum 95 RON gasoline for markets with advanced requirements for emissions control and fuel efficiency.<sup>8</sup> Many developed markets, including most of Europe, already have mandatory 95 RON minimum. Ford supports similar requirements in the U.S.

The U.S. is one of a few major developed countries without a minimum octane rating requirement. The last time the U.S. revisited the topic of gasoline octane rating occurred nearly a half century ago. Since

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<sup>6</sup> 45 FR 81593, 81599-81600 (Dec. 11, 1980); the rulemaking for the 2011 model year also acknowledged that "NHTSA has previously set standards with 2WD SUVs as light trucks." 74 FR 14420.

<sup>7</sup> We note that EPCA's definition of "passenger automobile" excludes "an automobile capable of off-highway operation." 49 U.S.C. § 32901 This, in turn, is a vehicle "that the Secretary decides by regulation" 1) has "a significant feature...designed for off-highway operation," and 2) "is a 4-wheel drive automobile or is rated at more than 6,000 pounds gross vehicle weight." This provision grants discretion to NHTSA to determine by rule what "is a 4-wheel drive automobile." This could reasonably include all automobile models offered with 4-wheel drive, and in fact this is how the law was understood by NHTSA and the regulated community prior to the 2011 model year.

<sup>8</sup> Fifth Edition Worldwide Fuel Charter. (2013) [https://autoalliance.org/wp-content/uploads/2017/01/WWF\\_C5\\_2013-Double.pdf](https://autoalliance.org/wp-content/uploads/2017/01/WWF_C5_2013-Double.pdf)

then, continuing reductions of GHG emissions and improving fuel economy have become worthy objectives that have garnered world-wide support by both customers and governments.

Implementation of higher octane-rated gasoline in the marketplace would result in a cost-effective and immediate method to improve fuel economy across the light-duty vehicle fleet. A recent study performed by MIT<sup>9</sup> found that by switching to higher octane fuel (approx. 98 RON for regular grade gasoline) in new light-duty vehicles:

*“...net CO2 emissions are reduced by 19–35 Mt/y in 2040 (2.5–4.7% of total direct LDV CO2 emissions). For the strategies studied, the annual direct economic benefit is estimated to be \$0.4–6.4 billion in 2040, and the annual net societal benefit including the social cost of carbon is estimated to be \$1.7–8.8 billion in 2040. Adoption of a RON standard in the US in place of the current antiknock index (AKI) may enable refineries to produce larger quantities of high-RON gasoline.”*

Higher octane gasoline enables opportunities for the use of key energy-efficient technologies, including: higher compression ratio engines, lighter and smaller engines, improved turbocharging, optimized engine combustion phasing/timing, and low temperature combustion strategies. All of these technologies paired with higher octane gasoline permit smaller engines to meet the demands of the consumer while at the same time providing higher overall efficiencies. Liquid fuels will continue to be in use by the US transportation sector for decades to come. Matching fuels and combustion technologies is the key logical next step necessary to continue improvements in engine optimization for emission reductions.

Similarly, Ford also supports an increase in the use of renewable fuels including Low Carbon Fuels in support of societal emissions reductions. When assessing all of these factors and taking into account the widespread availability of E10 (ethanol concentration at 10% by volume), the minimum octane rating recommendation is 95 RON.

## **9. Bifurcated GHG Standards**

As we have stated above, Ford supports the renewal and continuation of ONP, such that Ford will be able to comply with EPA, NHTSA, and California requirements by meeting a harmonized set of standards, and such that we can continue to make improvements in fuel economy for our customers. This outcome would provide the greatest level of efficiency and certainty, and would allow Ford and other manufacturers to develop future product plans over the next 6 to 7 years with high confidence in regards to the regulatory landscape. As of the date on which these comments are submitted, however, it is unclear whether ONP will continue. Reverting to a “bifurcated” regulatory scenario, in which Ford would have to comply with separate Federal and California standards, would not be optimal and would present

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<sup>9</sup> Raymond L. Speth, Eric W. Chow, Robert Malina, Steven R. H. Barrett, John B. Heywood, and William H. Green, “Economic and Environmental Benefits of Higher-Octane Gasoline” *Environ. Sci. Technol.*, 2014, 48 (12), 6561–6568, doi: 10.1021/es405557p

difficulties for Ford and the automotive industry as a whole. This section addresses the problems presented by that scenario.

Ford's product cycle requires about 6 years of lead time to properly and adequately plan for vehicle or powertrain architectures, and approximately 4 years of lead time to plan for individual vehicle programs. Because these vehicle programs typically run for 3 years, our regulatory lead time (i.e., awareness of future regulatory requirements) is 7 years. Compliance with regulatory standards, including the company's projected vehicle compliance plan and the anticipated usage or generation of credits, is factored into the product plan. The plans for any given powertrain architecture or vehicle program must be considered because CAFE and GHG standards apply on a fleet average basis. Thus, in developing plans for compliance with future CAFE and GHG standards, hundreds of variables must be considered and balanced. These variables range from powertrain and electrification technologies, weight, and aerodynamic characteristics of each individual vehicle, to the anticipated customer demand for different powertrain or driveline options, to the projected sales figures for each model to be offered, to the projected fuel economy capability of each model, and so on. Additional variables outside of Ford's control include electric vehicle incentives, electric vehicle infrastructure, fuel prices, and customer willingness to pay for fuel economy, among others. The proper balancing of all these factors, both those within and outside of our control, is an extremely complex exercise, and product planners typically develop and evaluate hundreds of potential scenarios in an effort to optimize the company's plans for compliance, sales, and profits.

Ford currently develops a single fleet for the U.S. market. If ONP dissolves, and Ford is forced to comply with bifurcated Federal and state standards, Ford would need to re-optimize and manage its compliance plan based on the new, bifurcated regulatory framework. The current regulations allow for fleet balancing across the U.S. fleet, which allows some states' mixes to be different based on different market needs. Under a bifurcated scenario, the company would be forced to adjust the plan to different vehicle mixes in different states, depending on the characteristics of the vehicle market and the CAFE/GHG regulations applicable in each state. Along with regulatory requirements, competitive pressures would play a significant role in determining how to react to any given scenario. Ford cannot prosper by ceding profit opportunities to other manufacturers; the company would need to determine how best to compete on both sides of the bifurcated market and develop its plans accordingly.

In the short term, little or nothing could be done to re-optimize the company's product plans, which are largely fixed for the next few years. Therefore, Ford's only recourse in the short term would be to "mix manage" the fleet of vehicles it is currently building by altering the way it distributes vehicles to various states around the country. This approach is far from optimal and could lead to a loss of profit and/or missed profit opportunities because of the misalignment between the new regulatory landscape and the original product plan. The long-term impact is difficult to quantify, but could be quite negative to Ford's financial health and its employees. It could also result in limitations on vehicle and/or powertrain offerings to the customer, particularly in California and the Section 177 states.

Over the longer term, with the passage of several years, Ford would be able to re-optimize its product plans and processes in light of the regulatory changes. Even so, the bifurcated scenario is far from ideal. Rather than developing our plans with a nationwide set of standards and a nationwide vehicle

market in mind, Ford would be forced to contend with a bifurcated market. There would likely be different vehicle mixes for different states or regions. States affected by the California requirements would face market constraints that do not apply in other states, and these differences would have to be factored into Ford's product plans. Vehicle distribution issues could also arise; in some cases, products made available on an unrestricted basis in one state might have to be restricted for sale in another. This could lead to negative reactions from consumers and dealers. Thus, even in the long term, a bifurcated set of rules creates the potential for added complexity, inefficiency, and customer and dealer dissatisfaction with product availability, due to the disparity in the vehicle offerings for different states. The added regulatory complexity could increase spending, which in turn could potentially impact the long-term spending on future vehicle and powertrain technologies that would improve CO<sub>2</sub>. For these reasons, among others, Ford supports the continuation of ONP.

#### **10. Adverse Consequences of Litigation**

If no agreement is reached to extend ONP, Ford is also concerned that possible litigation over the final rule may create problems and complications of its own. If the final rule faces a substantial challenge in court, there could be an extended period of uncertainty over the direction of future CAFE and GHG standards. Ford remains committed to year-over-year reductions in CO<sub>2</sub>, and regardless of the regulatory outcome, we will continue to deliver on this commitment. However, we may have to take conservative, less-than-optimal planning actions to ensure our plan is rigorous enough to withstand any possible litigation outcome. If such litigation extends to the end of the 2020 calendar year and beyond—a timeframe that could be likely—manufacturers will face great uncertainty with respect to the regulatory standards governing future model years. This could affect not only plans for mix-management in the short term; it could also affect Ford's ability to engage in timely long-term product planning out to the 2026 MY and potentially beyond, including the spending on future vehicle and powertrain technologies that would improve CO<sub>2</sub>.

If a court were to "vacate" the final rule, in whole or in part, and impose a more stringent set of standards for one or more model years, this could have significant adverse consequences on Ford and other manufacturers—not to mention consumers and the overall economy. Any sort of eleventh-hour adjustment to future standards would leave Ford with a sub-optimal product portfolio relative to the newly-established standards. At a minimum, this would have adverse effects on Ford's profits; it could also force Ford and other manufacturers to attempt to compensate by suddenly raising prices on vehicles with lower fuel economy, which would have adverse impacts on consumers. Depending on the specific model years at issue, and the extent of the differences between the vacated standards and the court-imposed standards, Ford could find itself in a compliance shortfall situation with very limited options for recovery. In the short term, Ford might be forced to impose restrictions on the sale of various models, and/or powertrain-model combinations, in order to make up a deficit. In the longer term, Ford might have to consider more drastic actions, such as discontinuing selected powertrains altogether. Such actions would have cascading negative effects on consumers, the workforce, and the economy as a whole. In the event that litigation over the final rule does ensue, these issues must be taken into account to ensure that any court-imposed remedy does not impose unnecessary economic damage.

Likewise, prolonged litigation between the federal government and California over CAFE preemption and Clean Air Act waivers could also have significant adverse consequences. In the scenario where a final rule is followed by preemption litigation, manufacturers would be bound by uncertainty with respect to future product planning and mix management. Ford would be unable to optimize its plans for both the “preempted” and “bifurcated” outcomes, so we would be forced to prepare for both GHG emissions compliance and ZEV mandate compliance under the most restrictive possible outcome, recognizing that such plans would be far from optimal under other possible outcomes. Inherent in this scenario would be lost profit and an inability to engage in meaningful future product planning until the litigation was resolved, including any appeals. The longer the period of uncertainty, the greater the potential damage to Ford, including its employees. Easily lost in all of these scenarios is the fact that Ford would also need to continue meeting fleet average requirements for non-GHG emissions; this factor adds complexity and can pose significant challenges whenever phase-in plans are upended.

Rather than risking such litigation, and the potential downsides it could hold for manufacturers, consumers, and the economy, Ford urges all key stakeholders to come together in support of a renewed set of ONP standards. A refreshed ONP is the best and surest way to provide for a workable, efficient set of standards, and to support a healthy U.S. vehicle market going forward. Failing that, we would stress the importance of avoiding prolonged litigation that could 1) impose regulatory uncertainty on the auto industry for an extended period of time; 2) force sudden regulatory changes upon manufacturers with inadequate lead time; and/or 3) compel manufacturers to comply with multiple sets of unnecessary, duplicative, or conflicting regulatory standards or burdens. Ford does not question the need for regulation in this area, but the regulations should be administered as efficiently as possible with minimal conflict among regulators.

### **Conclusion**

Ford appreciates EPA and NHTSA’s consideration of these comments, as well as those submitted by the Alliance. As the Agencies begin developing the final rule, we urge you to make a concerted effort to bring all key stakeholders together in support of a revised One National Program. We believe that, within the general range of alternatives identified by the Agencies, it should be possible to find common ground. By going the extra mile to seek common ground, the Agencies can help avoid protracted litigation, regulatory uncertainty, and the possibility of a bifurcated GHG program. Avoiding these undesirable outcomes would be greatly beneficial for consumers, workers, and the U.S. economy as a whole.