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OFFICE OF
AIR AND RADIATION

November 12, 2014

CD-14-18 (LDV/LDT/ICI/LIMO)

SUBJECT: E85 Flexible Fuel Vehicle Weighting Factor for Model Year 2016-2018 Vehicles

Dear Manufacturer:

Under EPA's light-duty vehicle greenhouse gas (GHG) program, starting with the 2016 model year, the regulations describe two pathways for determining the GHG value for a gasoline-E85 flexible fuel vehicle (FFV). The default approach is to use the value determined for operation on gasoline (see 40 CFR 600.510-12(j)(2)(vi)). The alternative is to combine the gasoline and E85 GHG values together in a way that accounts for the real-world use of E85 with a weighting factor (this weighting factor is described as "F" in the regulations (see 40 CFR 600.510-12(j)(2)(vi) and (k)).

The regulations describe two different approaches that may be used to determine the value of F. First, upon written request from a manufacturer, EPA "will determine and publish by written guidance an appropriate value of F for each requested alternative fuel based on the Administrator's assessment of real-world use of the alternative fuel" (see 40 CFR 600.510-12(k)(1)).¹ Second, a manufacturer may submit its own data to EPA that demonstrates the real-world use of the alternative fuel and determines an appropriate value of F specific to its vehicles (see 40 CFR 600.510-12(k)(2)).

Several manufacturers have requested that EPA expeditiously determine and publish a value of F for E85 to apply beginning with model year 2016 FFVs. EPA released a draft guidance document in March 2013, followed by an opportunity for public comment. Based on EPA's analysis following the comment period, EPA is issuing this guidance with respect to E85 alternative fuel as directed by 40 CFR 600.510-12(k)(1).

For the 2016-2018 model years, manufacturers of E85-fueled FFVs may use $F=0.14$ in the calculation described in 40 CFR 600.510-12(j)(2)(vi). A manufacturer's use of $F=0.14$ is optional; manufacturers may continue to use the default value of $F=0$, thus not taking account of the E85 carbon-related exhaust emissions (CREE) value (or they may determine and seek approval for their own manufacturer-specific F factor, as described above). Manufacturers may continue to use $F=0.14$ through the 2018 model year. EPA will establish a value of F for model

¹ Although the regulations prescribe use of notice-and-comment procedures, EPA's determination is a factual adjudication of an appropriate F factor of appropriate duration.

years 2019 and later in future guidance. The derivation of F=0.14 for model years 2016-2018 is described in the attachment to this letter, which includes a review of public comments received on the draft guidance. The 0.14 F factor may not be used beyond the 2018 model year.

The equation using the F factor is described in 40 CFR 600.510-12(j)(2)(vi) as follows:

$$CREE = (F \times CREE_{alt}) + ((1 - F) \times CREE_{gas}),$$

where $CREE_{alt}$ is the CREE value calculated for the model type using the alternative fuel (in this case E85) and $CREE_{gas}$ is the CREE value calculated for the model type while operating on gasoline. For example, for an FFV emitting 330 g/mi CREE when tested on E85 and 350 g/mile CREE when tested on conventional gasoline, the CREE value for the FFV model type that would be used in the fleet average calculations under 600.510-12 would be calculated as follows:

$$CREE = (0.14 \times 330) + (0.86 \times 350) = 347 \text{ g/mi}$$

There are several important things to note for manufacturers electing to use this F value:

1. Do not apply a multiplier of 0.15 to the E85 CREE value before combining with the gasoline CREE value. The requirements to use a multiplier of 0.15 for purposes of the greenhouse gas emissions standards extend only through the 2015 model year (see 40 CFR 600.510-12(j)(2)(iv) and (vi)).
2. Manufacturers electing to use the 0.14 F value must apply it to all of the gasoline-E85 FFVs in its fleet for a given model year, regardless of the relative E85 and gasoline emission values. In other words, this value may not be used solely on FFVs where the E85 CREE value is lower than the gasoline CREE value.
3. Manufacturers may choose to use either F=0.14, F=0, or their own uniquely derived F factor if one has been approved by EPA, on a model year by model year basis, but only one value may be used within a single model year. For example, using F=0.14 for the 2016 model year does not prevent a manufacturer from using F=0 for 2017 model year vehicles, or vice versa.
4. Manufacturers continue to retain the option of submitting their own data demonstrating the real-world use of E85 and an estimate of the F factor for specific model types or an F factor generally applicable to the manufacturer's dual fuel fleet, and requesting that EPA approve the unique F factor for use in the equation above for those model types (see 40 CFR 600.510-12(k)(2)).

If you have any questions about this guidance, please contact your certification representative.

Sincerely,

A handwritten signature in black ink, appearing to read "Byron J. Bunker". The signature is fluid and cursive, with a long horizontal stroke at the end.

Byron J. Bunker, Director
Compliance Division
Office of Transportation and Air Quality

Enclosure

Enclosure to CD-14-18

Final Determination of Weighting Factor for Testing E85 Flexible Fuel Vehicles (FFV) for MYs 2016-2018 Vehicles Under the Light-duty Greenhouse Gas Emissions Program

1. Introduction

This document provides the supporting analysis and rationale for the weighting factor being established by EPA under the light-duty vehicle greenhouse gas (GHG) program to be used to weight E85 flexible fuel vehicle (FFV) carbon dioxide (CO₂) emissions when tested with both gasoline and E85 (a mixture of 85 percent ethanol and gasoline). EPA released a draft guidance document in March 2013, followed by an opportunity for public comment. The draft guidance included an E85 weighting factor of 0.2. EPA is finalizing a weighting factor of 0.14 for MY 2016-2018 E85 flexible fuel vehicle (FFV) carbon dioxide (CO₂) emissions for reasons discussed below.

The weighting factor represents EPA's assessment of E85 fuel use over the lifetime of the FFV and is therefore based on projections. The draft 0.2 weighting factor was based on an analysis using a wide range of future projections including the Renewable Fuel Standards (RFS) mid level ethanol case and U.S. Energy Information Administration (EIA) release of Annual Energy Outlook 2013 (AEO 2013) ethanol volume scenarios considered by EPA, aggressive E15 use and no E15 use scenarios, and three FFV sales projection scenarios. This resulted in a combination of 12 different scenarios. The draft 0.2 factor represented an average value across this broad range of scenarios and was not based on any one primary scenario. EPA received 14 public comments including comments from representatives of the auto manufacturers, ethanol producers, and non-governmental organizations, as shown in the table below. After considering the comments and for reasons discussed below, EPA is finalizing a weighting factor of 0.14. The 0.14 weighting factor is based on a single scenario using total ethanol volume projections, ethanol blend scenarios, and FFV sales projections from U.S. EIA's recently released Annual Energy Outlook 2014 (AEO 2014).²

List of Commenters

Alliance of Automobile Manufacturers (Alliance)	Growth Energy
American Council for an Energy-Efficient Economy (ACEEE)	Renewable Fuels Association (RFA)
American Lung Association (ALA)	American Coalition for Ethanol (ACE)
Union of Concerned Scientists (UCS)	National Corn Growers Association (NCGA)
The International Council on Clean Transportation (ICCT)	Illinois Renewable Fuels Association
BP	Algenol Biofuels
Biotechnology Industry Association	3S Environmental And Energy Strategies

² <http://www.eia.gov/forecasts/aeo/>

Beginning in model year (MY) 2016, EPA's light-duty vehicle GHG program no longer allows FFV credits, but instead the GHG compliance values of an FFV must be based on actual emissions performance of the FFV on both gasoline and the alternative fuel, weighted by the EPA's assessment of the actual use of these fuels by the FFV. EPA is establishing this factor at a level of 0.14 for MY 2016-2018, based on EPA's assessment of the projected average real world use of E85 over the lifetime of MY 2016 FFVs. The weighted CO₂ emissions level may be used as the certification CO₂ level for individual MY 2016-2018 FFV models in determining the overall fleet average CO₂ emissions for the manufacturer's MY 2016 fleet. This means EPA is projecting that 14 percent of a MY 2016-2018 FFV's lifetime miles driven will be fueled on E85. EPA is determining this weighting factor upon written request from auto manufacturers per the regulatory provisions contained in 40 CFR Part 86 600.510-12(k)(1). These regulatory provisions were established as part of the rulemaking setting GHG and corporate average fuel economy (CAFE) standards for MY 2012-2016 light-duty vehicles.³ As discussed below, manufacturers may not use the 0.14 weighting factor beyond MY 2018. EPA plans in the next few years to issue subsequent guidance to establish an F factor for MY 2019 and later based on updated information.

Section 2 of this document provides background information on how FFVs are treated in MYs 2012-2015, why EPA is establishing the weighting factor for MY 2016-2018, and how the F factor may be used in determining FFV CO₂ emissions levels for these model years. Section 2 also briefly discusses EPA's plans for establishing weighting factors for MY 2019 and later. Section 3 provides a comparison of EPA's approach under the GHG program for MYs 2016 and later with that of the CAFE program for MY 2016 and later. Section 4 provides the analysis on which EPA is basing the 0.14 weighting factor, including a review of public comments.

2. Treatment of Flexible Fueled Vehicles under the EPA Model Year 2012-2016 Light-duty GHG Rule

2.1. Background on Model Years 2012-2015

As discussed in the MY 2012-2016 Final Rule, EPA allows FFV compliance values corresponding to the compliance values allowed by CAFE during the period from MYs 2012 to 2015. These are commonly called FFV credits. At the time when the 2012-2016 standards were under development (in 2009-2010), several manufacturers had already taken the availability of FFV credits into account in their near-term planning for CAFE and this reliance needed to be considered in assessing necessary lead time for the CO₂ standards. Manufacturers commented during the rulemaking that the credits were necessary to allow them to transition to the new standards. EPA thus allowed these credits, in the near term, helping to provide adequate lead

³ 75 FR 25342, 25432-25434 (May 7, 2010). The tailpipe GHG emissions used for compliance with the CO₂ standards described in 40 CFR 86.1818 are the carbon-containing emissions (generally, CO₂, hydrocarbons, and carbon monoxide), which are summed based on the carbon weight fraction of each component into a value described in the regulations as the "carbon-related exhaust emissions" (CREE). For simplicity, however, in this support document, we are using the term CO₂ instead of CREE, as CO₂ is more broadly understandable and makes up the vast majority of the total carbon tailpipe emissions from vehicles.

time for manufacturers to implement the new multi-year standards. This also helped to harmonize the GHG and the CAFE programs during these interim years.⁴

As under CAFE (as required by EPCA),⁵ EPA bases MY 2012-2015 FFV CO₂ emissions on a 50/50 weighting of the measured CO₂ emissions when the vehicle is tested on gasoline and with E85. This approach essentially assumes that over the life of the FFV, 50% of their operation is on the alternative fuel and 50% of the operation is on conventional fuel, resulting in CO₂ emissions that are based on an arithmetic average of alternative fuel and conventional fuel CO₂ emissions. In addition, the measured CO₂ emissions on the alternative fuel are multiplied by a 0.15 volumetric conversion factor. Through this mechanism a gallon of alternative fuel is deemed to contain 0.15 gallons of fuel. For example, for a flexible-fuel vehicle that emitted 330 g/mi CO₂ operating on E85 and 350 g/mi CO₂ operating on gasoline, the resulting CO₂ level to be used in the manufacturer's fleet average calculation would be:

$$CO_2 = \frac{[(330 \times 0.15) + 350]}{2} = 199.8 \text{ g / mi}$$

For MYs 2012-2015, EPA also established FFV credit limits or caps intended to be equivalent to the credit caps established for CAFE under EPCA/EISA. The FFV credit caps for CAFE are 1.2 mpg for model years 2012-2014 and 1.0 mpg for model year 2015.⁶ The CO₂ FFV credits limits for MY 2012-2015 are based on a manufacturer's fleet-average performance.

Both the 50/50 weighting and the use of the 0.15 volumetric conversion factor were an established part of the CAFE program (as required by statute) prior to the MY 2012-2016 rulemaking. EPA understands that by using the CAFE approach -- including the 0.15 factor -- the calculated CO₂ emissions value for the vehicle is significantly lower than it actually is, even if the vehicle operated on the alternative fuel at all times. This represents a "credit" being provided to FFVs for MYs 2012-2015.

In the MY 2012-2016 rule, EPA determined that there is adequate lead time to meet GHG standards over the long term without the use of FFV credits. Therefore, beginning in MY2016, the FFV credits as described above for MY2012-2015 (that is the assumed 50/50 usage of the gasoline/E85 and 0.15 factor described above) are no longer available for EPA's GHG program. Rather, GHG compliance values are based on actual emissions performance of the FFV on conventional and alternative fuels, weighted by the EPA's assessment of the actual use of these fuels in the FFVs. The approach for MY 2016 and later is discussed in further detail below.

2.2. Background on MY 2016 and Later

For 2016 and later model years, EPA's program treats FFVs similarly to conventional fueled vehicles in that FFV emissions will be based on measured CO₂ results from emissions testing on the fuels on which the vehicle operates. In calculating the emissions performance of an FFV,

⁴ See 75 FR 25432 (May 7, 2010).

⁵ 49 U.S.C 32905 (b).

⁶ 49 U.S.C 32906 (a).

manufacturers may base FFV emissions on vehicle testing based on the alternative fuel emissions if there is a demonstration that the alternative fuel is likely to actually be used in the vehicles. The default absent such a demonstration is that performance will be calculated assuming use only of conventional fuel over the vehicle's useful life. The manufacturer must estimate the ratio of operation that will be on the alternative fuel compared to the conventional fuel. As shown in the equation below, the ratio (F) can be used to weight the CO₂ emissions performance over the 2-cycle tests on the two fuels. The 0.15 conversion factor (discussed in the previous section) will no longer be included in the CO₂ emissions calculation.

$$CO_2 = (F \times CO_{2\ E85}) + ((1-F) \times CO_{2\ E0})$$

For example, for an FFV emitting 330 g/mi CO₂ when tested on E85 and 350 g/mile CO₂ when tested on conventional gasoline, with an estimated vehicle miles travelled (VMT) weighting of 14 percent on E85 and 86 percent on gasoline, the CO₂ emissions for the FFV would be calculated as follows:

$$CO_2 = (0.14 \times 330) + (0.86 \times 350) = 347 \text{ g/mi}$$

One option EPA finalized in the MY 2012-2016 rule is for EPA to establish the weighting factor based on a national average approach considering national E85 fuel use. The MY 2012-2016 final rule provided that upon a manufacturer's written request, EPA "will determine and publish by written guidance an appropriate value of F for each requested alternative fuel based on the Administrator's assessment of real-world use of the alternative fuel," where F is the weighting factor to be used to weight the CO₂ emissions of the FFV on gasoline and on the alternative fuel (the value of 0.14 in the above example).⁷ Manufacturers could then use the EPA-determined value along with their vehicle emissions test results demonstrating emissions on E85, which are typically lower, to determine the emissions compliance values for FFVs.

The preambles to the MY 2012-2016 proposal and final rule discussed an approach where EPA would conduct an analysis of vehicle miles travelled (VMT) by year for all FFVs using its emissions inventory MOVES model.⁸ Using the VMT ratios and the overall E85 sales, E85 usage would be assigned to each vehicle. This method accounted for the VMT of new FFVs and FFVs already in the existing fleet using VMT data in the model and the EPA model would be used to determine the ratio of E85 and gasoline for new vehicles being sold. EPA noted that fluctuations in E85 sales and FFV sales would be taken into account to adjust the FFV's E85 actual use estimates. EPA also noted that it planned to make the assigned fuel usage factor available through guidance prior to the start of MY 2016 and adjust it as necessary.

In lieu of using EPA's estimated fuel usage factor based on the national average analysis, manufacturers have a second option of presenting their own data for consideration as the basis for evaluating fuel usage. As specified in the regulations, "the manufacturer may optionally submit to the Administrator its own demonstration regarding the real-world use of the alternative

⁷ 40 CFR §86 600.510-12(k)(1).

⁸ 74 FR 49454, 49532 (September 28, 2009) and 75 FR 25434 (May 7, 2010).

fuel in their own vehicles and its own estimate of the appropriate value of F.”⁹ Manufacturers must present a statistical analysis of alternative fuel usage data collected on actual vehicle operation. EPA did not attempt to specify how the data was to be collected or the amount of data needed. However, the analysis must be based on a sound statistical methodology. Uncertainty in the analysis must be accounted for in a way that provides reasonable certainty that the program does not result in a loss of emissions reductions.¹⁰

It is important to note that although the FFV weighting factor is needed prior to the end of MY 2016 so that manufacturers may include it in their CO₂ fleet average calculations, the F factor must be based on the projected use of the alternative fuel over the life of the MY 2016 vehicles. In a situation where the amount of alternative fuel being used and the sales of FFVs were stable, EPA could potentially base the weighting factor on an estimate of what the factor is for vehicles in-use today. Based on the current limited usage of E85, the F factor would be near zero. However, both the amount of ethanol being used and the sales of FFVs are currently in a state of considerable change. Under the Renewable Fuel Standard (RFS) program, the amount of ethanol consumed may increase significantly out into the future. Also, the production of FFVs has increased steadily over the last several years and continued production growth is possible. There is currently a great deal of uncertainty both in the amount of E85 that is likely to be consumed year by year and the number of FFVs that will be sold. For the draft guidance, to address this uncertainty for both FFV sales and E85 volumes, EPA evaluated a range of scenarios for both FFV sales and E85 volumes on which to base the weighting factor rather than a single or primary scenario. For this final guidance, EPA is basing the F factor primarily on AEO 2014 projections, as discussed in Section 4 below.

The MY 2012-2016 rule discussed an approach where EPA would determine the weighting factor prior to the beginning of MY 2016 (which begins on January 2, 2015) and adjust it annually as necessary.¹¹ In the MY 2017-2025 rule, automakers submitted comments requesting early guidance on the F factor so that automakers would have the relevant information needed for development of compliance plans. EPA believes that it is important to establish the weighting factor through MY 2018 now to provide manufacturers with as much lead time and certainty as possible for planning for MYs 2016-2018. In the MY 2017-2025 final rule, EPA reiterated its commitment to issue early guidance “well in advance” of each model year.¹² As discussed below, EPA plans to revisit the weighting factor for MY 2019. The 0.14 F factor may not be used beyond MY 2018.

2.3. Potential Impact of the Weighting Factor

The table below provides CO₂ certification data for a sample of MY 2013 FFV models. In many cases, CO₂ levels on E85 are in the range of 2 to 7 percent better than on conventional gasoline and it would be to the manufacturer’s advantage to weight in the lower emissions of the E85 operation.¹³ For vehicles with gasoline CO₂ emissions in the 200-300 g/mile range and

⁹ 40 CFR §86 600.510-12(k)(2).

¹⁰ 75 FR 25434 (May 7, 2010).

¹¹ 75 FR 25434 (May 7, 2010).

¹² 77 FR 62624, 62830 (October 15, 2012).

¹³ Lower g/mile emissions on E85 are attributable to a number of factors, including the chemical makeup of the fuel and the efficiency of the engine while operating on this fuel.

achieving a 5 to 10 percent benefit on E85 (assuming manufacturers optimize CO₂ performance on E85) compared to conventional gasoline, using an E85 weighting factor of 0.14 would lower the vehicle's CO₂ level by about 1-4 g/mile, depending on the vehicle's actual CO₂ levels.

CO₂ Emissions on Gasoline and E85 for Selected Model Year 2013 Vehicles

Make	Model	Engine/Trans	CO ₂		Difference	
			Gasoline	E85	g/mi	%
Chrysler	200	6 cyl 3.6L Auto	304.8	295.6	9.2	3%
Chrysler	300	6 cyl 3.6L Auto	296.9	287.3	9.6	3%
Chrysler	Town & Country	6 cyl 3.6L Auto	349.4	351	-1.6	-0%
Chrysler	Durango 4WD	6 cyl 3.6L Auto	374	354.8	19.2	5%
Chrysler	RAM 1500 4WD	8 cyl 4.7L Auto	491.2	454.6	36.6	7%
Ford	E150 Van FFV	8 cyl 4.6L Auto	477.3	457.2	20.1	4%
Ford	E350 Van FFV	8 cyl 5.4L Auto	543.1	521.5	21.6	4%
Ford	F150 Pickup 2WD FFV	6 cyl 3.7L Auto	360.6	343.9	16.7	5%
Ford	Focus SFE FWD FFV	4 cyl 2.0L Auto	204.5	207.8	-3.3	-2%
Ford	Explorer FFV 2WD	6 cyl 3.7L Auto	340.4	326.2	14.2	4%
GM	Buick LaCrosse	6 cyl 3.6L Auto	332	323.6	8.4	3%
GM	C15 Silverado 2D	8 cyl 5.3L Auto	406.1	383.1	23	6%
GM	Impala	6 cyl 3.6L Auto	314.2	293	21.2	7%
GM	K1500 Yukon Denali AWD	8 cyl 6.2L Auto	431.9	424.1	7.8	2%

As the data above indicate, there is a range of CO₂ performance on E85 compared to gasoline, and in a few cases FFV CO₂ emissions are worse on E85. Currently, because credits are calculated using a 0.15 factor (E85 CO₂ levels are multiplied by 0.15 in the calculation) and total credits are capped, there is not an incentive for manufacturers to optimize CO₂ emissions performance on E85. EPA believes that its approach for MY 2016 and later provides manufacturers with an incentive to optimize FFV emissions performance not only on gasoline but also on the alternative fuel.

3. Comparison with CAFE Program Treatment of Flexible Fueled Vehicles for MY 2016 and Later

49 U.S.C. section 32905 specifies how the fuel economy of dual fuel vehicles, including E85 FFVs, is to be calculated for the purposes of CAFE through the 2019 model year. In MY 2016 and later under CAFE, manufacturers continue to calculate credits using a 50/50 harmonic average of the fuel economy for the alternative fuel and the conventional fuel, irrespective of actual usage of each fuel. In addition, the fuel economy value for the alternative fuel continues to be significantly increased by dividing it by 0.15.

In addition, as required by 49 U.S.C. 32906, CAFE continues to include a cap on the increase in fleet average mpg from FFV credits for MYs 2016-2019, which decreases each year as shown in the table below. The cap applies separately for domestic passenger cars, import passenger cars, and light-duty trucks.

Model Year	Credit Cap (mpg)
2016	0.8
2017	0.6
2018	0.4
2019	0.2

In the MY 2017-2025 CAFE rulemaking, a new approach for FFVs was established for model years 2020 and later.¹⁴ After MY 2019, under CAFE a manufacturer will weight the FFV fuel economy on conventional gasoline and E85 in its harmonic average of the two values using the same real world weighting factor F that is used by manufacturers under the EPA program (rather than assuming a 50/50 weighting). This F factor would either be established by EPA or by the manufacturer under the process options described in Section 2.2 above (or zero if no factor is established). Weighting the fuel economy to better reflect real world usage is a major change from the approach mandated by 49 U.S.C. 32905 and it orients the calculation more to the real world impact on petroleum usage, consistent with the statute's overarching purpose of petroleum conservation. The CAFE program retains the 0.15 divisor for MYs 2020 and later, whereas the GHG program does not include the 0.15 divisor. Retaining the 0.15 divisor in CAFE for dual fuel vehicles is consistent with the procedures established by Congress for dedicated alternative fuel vehicles. As with the EPA program, there is no credit cap in the CAFE program for MY 2020 and later under this new approach finalized in the MY 2017-2025 rule.

EPA received comments from ICCT and ACEEE that the draft F factor of 0.2 could lead to very high uncapped credits under the CAFE program. The commenters are concerned that if the F factor is not based on actual use of the fuel, it could detract substantially from the efficacy of CAFE. The commenters are concerned that the initial F factor could set precedent for the value of the F factor for future model years. ACEEE noted that if an F factor of 0.2 is used in MY 2020, the CAFE credits for a vehicle with CO₂ levels of 200-300 g/mile would be in the range of 5.5 to 8.2 g/mile. EPA understands these concerns and reiterates that the F factor being established in this guidance will only apply to EPA's GHG program through MY 2018 and will not impact the CAFE program. An F factor established by EPA for MY 2019 and later will require future agency action that will include an opportunity for public comment. EPA does not view the guidance for MYs 2016-2018 as precedent setting. Determining an F factor is a fact-specific process, to be re-determined based on the facts available at the time EPA issues guidance. EPA will rigorously analyze available data concerning the trends in E85 fuel use and FFV sales in establishing an F factor for model years beyond 2018.

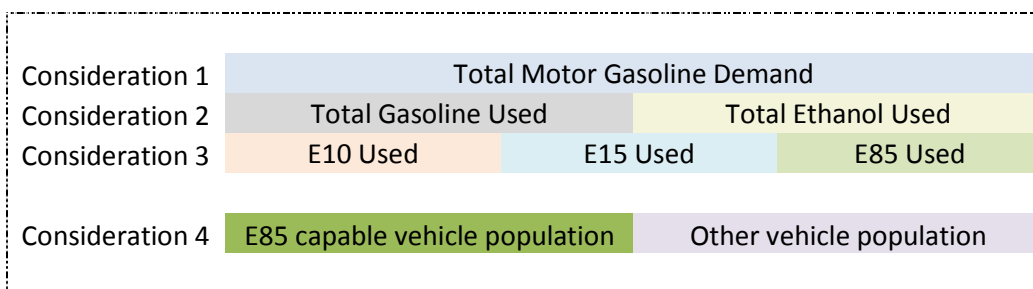
¹⁴ 77 FR 62830-62831 and 63127-63130 (October 15, 2012).

4. Analysis of E85 F Factor for MY 2016-2018 Vehicles

4.1. Analytic Methods

There is significant uncertainty regarding projecting future ethanol use and FFV sales over the lifetime of MY 2016-2018 vehicles. Thus, for the draft guidance we analyzed several possible scenarios. We considered four different factors in estimating national average consumption of E85 by FFVs. These factors (Figure 1) are (a) the total motor gasoline demand, (b) the total volume of ethanol, (c) the form of the ethanol-gasoline blend distributed to the consumer, and (d) the number of vehicles which consume the E85. These factors interact; as an example, both the number of FFVs and the volume of ethanol determine how much E85 is produced and sold.

Figure 1 – Factors in E85 Demand



There is uncertainty about each of these future projections. With regard to ethanol, the US market has reached the “E10 blend wall” or the point at which ethanol blends above E10 would be necessary to absorb the increased volumes of ethanol. Projecting the future volumes of different ethanol blends higher than E10 is uncertain.¹⁵ On the vehicle side, there is significant uncertainty with regard to the continued production rates of flex fueled vehicles.¹⁶ On the fuel side, there is likewise significant uncertainty of E85 sales, particularly over the full useful life of MY 2016-2018 vehicles. These complexities and considerations are discussed in the following sections.

For the draft guidance, to compensate for this uncertainty, rather than focusing on a single scenario, EPA evaluated a range of 12 scenarios that bracketed the possible outcomes. In the remaining sections of this document, we discuss inputs and present analyses for the different scenarios used for the draft guidance, the public comments on those scenarios, and EPA’s approach for the final guidance. For the draft guidance, we analyzed two assumptions about the total quantity of ethanol, two assumptions about the different ethanol-gasoline blends, and three assumptions regarding future FFV sales. As explained in detail below, after considering comments, new data available since issuance of the draft guidance, and the current ethanol market under EPA’s RFS program, EPA is basing the final F factor for MYs 2016-2018 on AEO 2014 projections for total ethanol volume, ethanol blend, and FFV sales projections.

¹⁵ For a discussion of the different combinations of E10, E15, and E85 that might result from the RFS volume requirements see the RFS2 final rule at 75 FR 14760-14763 (March 26, 2010).

¹⁶ Of note, this analysis uses FFV production volume as an input, and outputs an expected E85 usage fraction. This fraction, through the resulting vehicle credit, in turn circularly influences the FFV production volume.

4.1.1. Model Framework

This analysis was conducted using an updated version of the OMEGA model used in the MY 2017-2025 light-duty GHG rulemaking. The OMEGA benefits post processor spreadsheet (version 1.4.1)¹⁷ was extended to conduct the fuel volume calculations needed for this analysis.¹⁸ For this analysis, we also normalized the light duty energy demand (Figure 1, Consideration 1, above) to the motor gasoline (including E85) demand presented in the Energy Information Administration's (EIA's) Annual Energy Outlook (AEO), hereafter called AEO 2014.¹⁹ Thus, the population and VMT models in OMEGA were used to determine the allocation of energy between vehicle MYs, but not the overall amount of energy. Other than these changes, the inputs are either identical to those used in the rulemaking, or as described in the next sections. For this analysis, the light-duty GHG 2017-2025 rulemaking's scenario of the MY2010 base fleet was used.

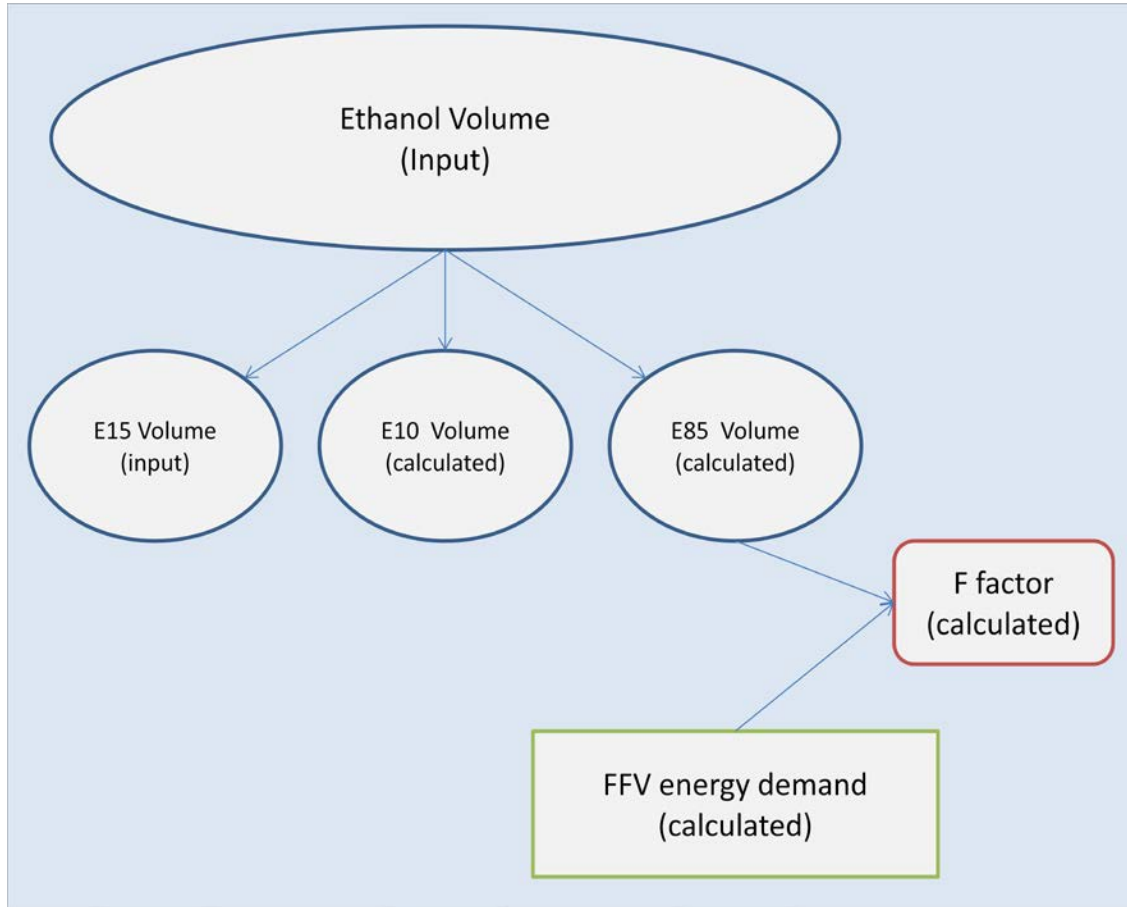
In the basic calculation of the F factor, the OMEGA model is given inputs as to the total number of FFVs sold each year, the total amount of ethanol used in each calendar year, and assumptions about E10/E15 usage. In the calculation, total energy, total ethanol, and E15 volumes are fixed as inputs, while the E10 and E85 volumes float in order to absorb the total ethanol volume (Figure 2). The model is used to calculate the total gallons of E85 required consuming the input ethanol quantity, and the fraction of miles the FFVs would need to run on ethanol in order to consume that fuel. This fraction is the "F factor" described above.

¹⁷ OMEGA Model v1.4.1 (<http://www.epa.gov/omswww/climate/models.htm>).

¹⁸ <http://www.epa.gov/otaq/regs/ld-hwy/greenhouse/ld-ghg.htm>.

¹⁹ See Table 45 of AEO 2014 for total energy volumes and Table 17 of AEO 2014 for projected renewable volumes.

Figure 2 - Calculation Dynamics



In this calculation, we neglect the marginal change in FFV energy demand as a result of the change in fuels. While an increase in E85 usage could decrease the total energy demand of the FFVs, this effect is small, and is a secondary consideration in this calculation.

4.1.2. FFV Sales Projections

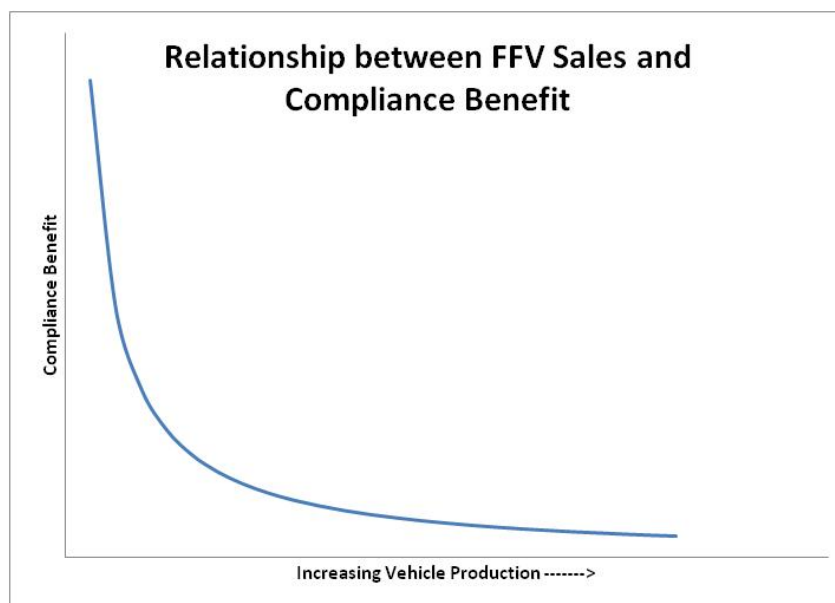
One of the difficulties in estimating the F factor is estimating the number of FFVs that will be sold in future years. As discussed below, there is a historic relationship between an incentive for FFV production (the CAFE credit) and the production of FFVs. However, we have no direct estimate of the relationship between the credit size and the production of FFVs, particularly in the context of a fleetwide standard that becomes increasingly stringent.

There is a likely equilibrium with regard to the compliance benefit for the manufacturer and the production of FFVs. There is a direct relationship between the F factor and the incentive for building FFVs, but an inverse relationship between number of FFVs sold and the F factor. With a given pool of ethanol, additional FFV sales decrease the value of the F factor per vehicle, as the additional vehicles reduce the amount of E85 that each individual vehicle will consume (Figure

3). Thus, at some level of sales and stringency, the cost for producing an FFV will be greater than the value received for producing it. In the absence of other factors, manufacturers are unlikely to build FFVs if the increased production costs exceed the compliance benefit. At the same time, as the FFV fleet grows there may also be a greater increase for E85 refueling infrastructure enabling the pool of ethanol to grow with the FFV fleet. How this will play out is difficult to see. For this reason, we evaluated a range of FFV production forecasts for the draft guidance.

Equation 1: Compliance Benefit \propto Gallons of E85 / FFV population

Figure 3 – Relationship of FFV Sales and Compliance Benefit (Constant Ethanol Volume)



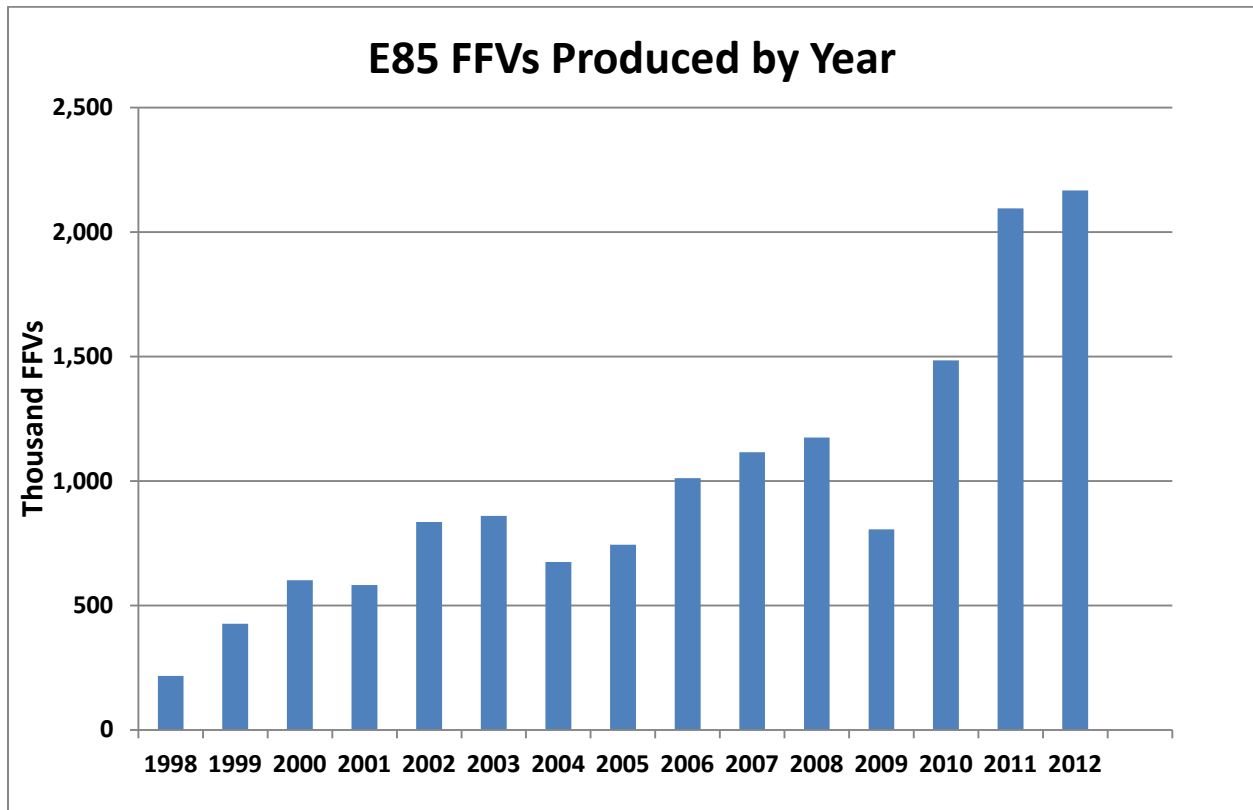
With regard to existing projections of FFV production, we are aware only of the Department of Energy / Energy Information Administration (EIA) projections of FFV sales. EIA projects FFVs as approximately 8% of light duty sales between 2012 and 2030 in AEO 2013 and revised this projection to 11% in AEO 2014.²⁰ These sales projections are based on assumptions regarding the CAFE credit value. EPA did not use EIA’s projections of FFV sales for the draft guidance but is using them for the final guidance, as discussed below.

²⁰ AEO 2014, Table 57. Light-duty Vehicle Sales by Technology Type.

4.1.2.1. Historic FFV Sales Rates

For the draft analysis, EPA projected that FFV production would grow as a percentage of overall vehicle production over time until leveling off in 2020. Several elements fed into the projections of FFV production EPA used in its draft guidance. EPA considered historic FFV production and conversion volumes (Figure 4) which have grown over time.

Figure 4 – Historic FFV Production²¹



EPA also reviewed production data submitted by manufacturers as part of the annual certification and compliance process. In MY 2012, FFV production was dominated by General Motors, Ford, and Chrysler. While these three domestic manufacturers produced approximately 40% of their fleet as FFVs, US production as a whole was at 16%. As seen below (Table 1), other manufacturers do not produce significant total numbers of FFVs relative to their own fleet, or the nation as a whole. These sales results are very similar to the MY 2011 sales results, where FFV sales made up about 17% of overall vehicle sales.

²¹ Sources: www.afdc.energy.gov/afdc/data except for MY 2011-2012 which are based on production data submitted to EPA by manufacturers.

Table 1 – MY 2012 FFV Production²²

Manufacturer	Units Produced	% Total US FFV Production	% Manufacturer Light-duty Vehicle Production
Chrysler	558,573	26%	36%
Ford	497,997	23%	28%
General Motors	1,031,257	48%	43%
Mercedes	21,385	1%	8%
Nissan	24,154	1%	2%
Toyota	31,670	2%	2%
Volkswagen	2,060	0.1%	0.4%
Fleet	2,167,096	100%	16%

4.1.2.2. FFV Sales Projections

EPA further examined the manufacturer vehicle production data to determine if the data supported particular projections of FFV sales. EPA attempted to identify a production cutpoint or other metric based on current data that could be applied across the fleet to determine a reasonable projection of potential future FFV sales. While the division of manufacturers between FFV producers and non-producers is clear, there is no such line amongst vehicle production. FFVs are applied in both high volume and low volume vehicles, and the same engine is frequently used in both FFV and non-FFV applications, sometimes in the same vehicle model. While FFVs production historically tended to be focused on light trucks, there are currently several passenger car models that are FFVs. EPA was not able to identify a production cut point or other metric that could be applied across the fleet to project potential future FFV sales. Manufacturer considerations beyond those discussed here are likely to drive future trends; however, these considerations likely differ by manufacturer and application.

Given the lack of clarity in industry trends for FFV production, for the draft guidance analysis we created three projections – lower FFV sales, mid FFV sales, and a higher FFV sales scenario. All three scenarios rise from the current sales level to a maximum sales fraction in MY 2020. The projected FFV sales fractions used in the modeling for the draft guidance were 25%, 38%, and 50% by 2020. The projections assumed that incentives would be sufficient to induce manufacturers to continue to produce larger volumes of FFVs as a fraction of total production into the future. We assumed that the manufacturer’s desire to obtain the compliance benefit from use of FFV E85 emission values would increase as the fleetwide CO₂ standard continues to increase in stringency.

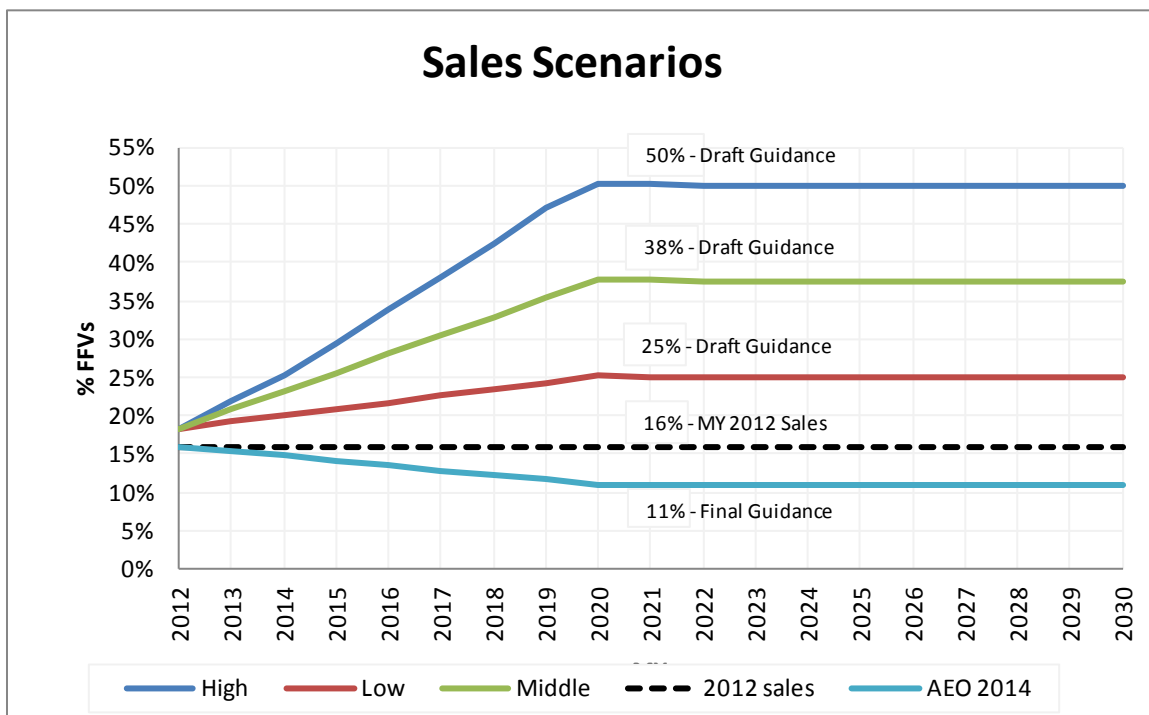
All commenters that provided comment on the FFV sales projections recommended that lower sales projections should be used, noting that the benefit of producing FFVs is reduced significantly under the F factor approach compared to the CAFE approach. The Alliance commented that the overall fleet benefit constitutes a greater than 95% reduction in FFV benefit in comparison to the CAFE calculation. This is on top of the extra technical difficulties which

²² Greenhouse Gas Emission Standards for Light-duty Vehicles Manufacturer Performance Report for the 2012 Model Year, EPA-420-R-14-011, April 2014 (<http://www.epa.gov/otaq/climate/ghg-report.htm>).

may be experienced in certifying new FFV concepts to emission standards other than GHG, especially in light of the higher level of highly boosted, downsized motors predicted for deployment by the industry in the future. Growth Energy commented that EPA’s projections seem optimistic considering the sizable number of automobile manufacturers not currently producing FFVs under the current CAFE program which provides considerably more incentive compared to the F factor. Renewable Fuels Association and other ethanol representatives similarly commented that lower sales projections should be used.

For the final guidance, EPA is using the AEO 2014 FFV production projection of 11 percent for 2020 and later. EPA reviewed the MY 2012 FFV production data which showed that FFV sales have declined in terms of percent of sales from 17% of sales in 2011 to 16% of sales in 2012. For the final guidance, EPA is using a projection of declining percent sales from 16% in 2012 to 11% in 2020 with sales remaining at 11% thereafter, consistent with AEO 2014. This approach is responsive to comments that EPA’s draft projections were too high and consistent with the decline in percent of sales from 2011 to 2012. This approach is also consistent with using AEO projections for total ethanol volumes as fewer FFVs will be available to consume E85 under this lower ethanol scenario.

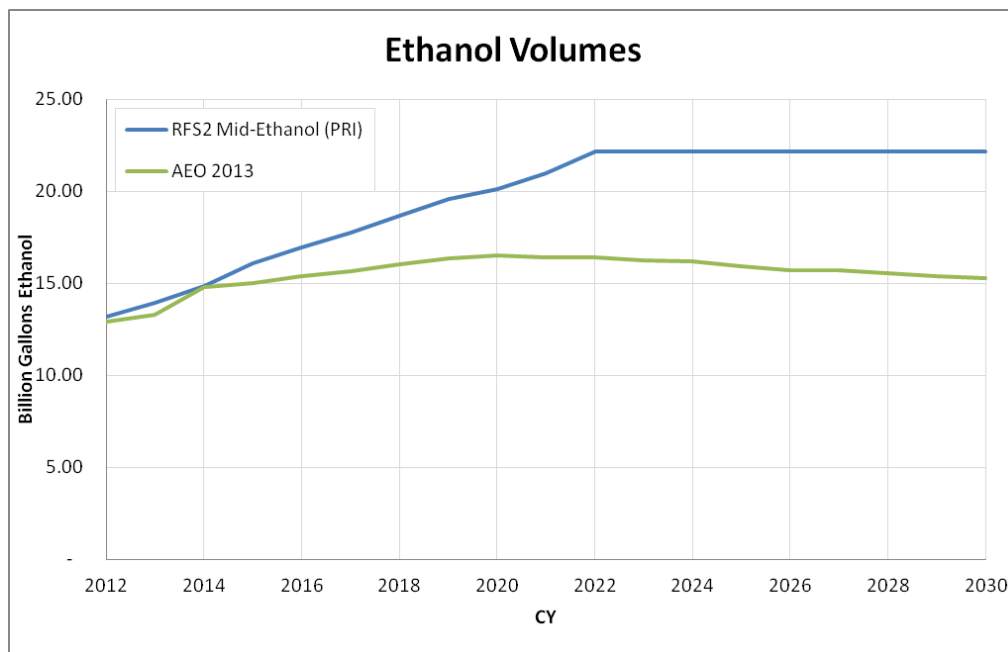
Figure 5- FFV Sales Scenarios



4.1.3. Total Ethanol Volume Projections

For the draft guidance, we considered two different total ethanol projections. In the first, the mid-ethanol case from the RFS2 rulemaking,²³ the full volume requirements of the RFS program are met in all years and the volume of ethanol used to meet those requirements (as opposed to other types of renewable fuel) are in the middle of the range of possible outcomes. In the second, we used the latest available EIA projection of ethanol production and use from AEO 2013 early release for an alternate projection of future ethanol volume.²⁴ For the draft guidance, we considered these two scenarios reasonable bounds on the potential future volumes of ethanol.

Figure 6 – Ethanol Volume Projections Used in the Draft Guidance



EPA received diverse comments on what total ethanol volumes should be used in the analysis. The Alliance and ethanol industry commenters generally supported using higher ethanol volumes which would in turn would result a higher F factor (for a given production of FFVs). The Alliance commented that the AEO scenario should be dropped because RFS is required by law and manufacturers should not be penalized if other parties do not comply. Growth Energy and RFA also supported using high and mid-case RFS scenarios without including the AEO scenarios. The National Corn Growers Association, Illinois RFA and the American Coalition for Ethanol supported including multiple high and mid RFS cases rather than just the RFS mid case, along with the AEO scenario.

²³ Also known as the "Primary Control Case" in the RFS2 final rule. See 75 FR 14741 (March 26, 2010).

²⁴ See Table 11 of AEO 2013ER for projected ethanol volumes.

UCS commented that only the AEO scenario should be included. UCS commented that the RFS targets were aspirational and non-binding and speculated that RFS targets will not be met through 2022. ICCT and ACEEE recommended that EPA not use projections as the basis for the F factor but that it should be based on historical fuel use. ICCT estimated that this approach would result in an F factor of approximately 0.01.

EPA is basing the final F factor exclusively on the AEO 2014 projections.²⁵ In the 2014 RFS proposed rule, EPA has for the first time proposed to partially waive the total RFS volumes specified in the Energy Independence and Security Act of 2007 (EISA2007) based on reasonable projections of biofuel use. It is unlikely that the renewable fuel volumes specified in the statute through 2022 will all be attainable in the time-frame envisioned. EPA is not prepared at this time to project future ethanol volumes over the full useful life of MY 2016-2018 FFVs. Therefore, EPA is using the projections provided in AEO 2014 as the best projections currently available and is no longer averaging in scenarios based on RFS. The other option would be to postpone setting the F factor until additional data is available, which would negatively impact manufacturer lead-time and certainty. EPA believes that basing the F factor on historic fuel use would be too conservative because it does not account for any continued phase-in of the RFS program. The F factor is an estimate of fuel use over the life of MY 2016 vehicles and basing the F factor on historic use would not include any continued growth of ethanol volumes, whereas AEO 2014 does include an estimate for continued growth taking into account the RFS program.

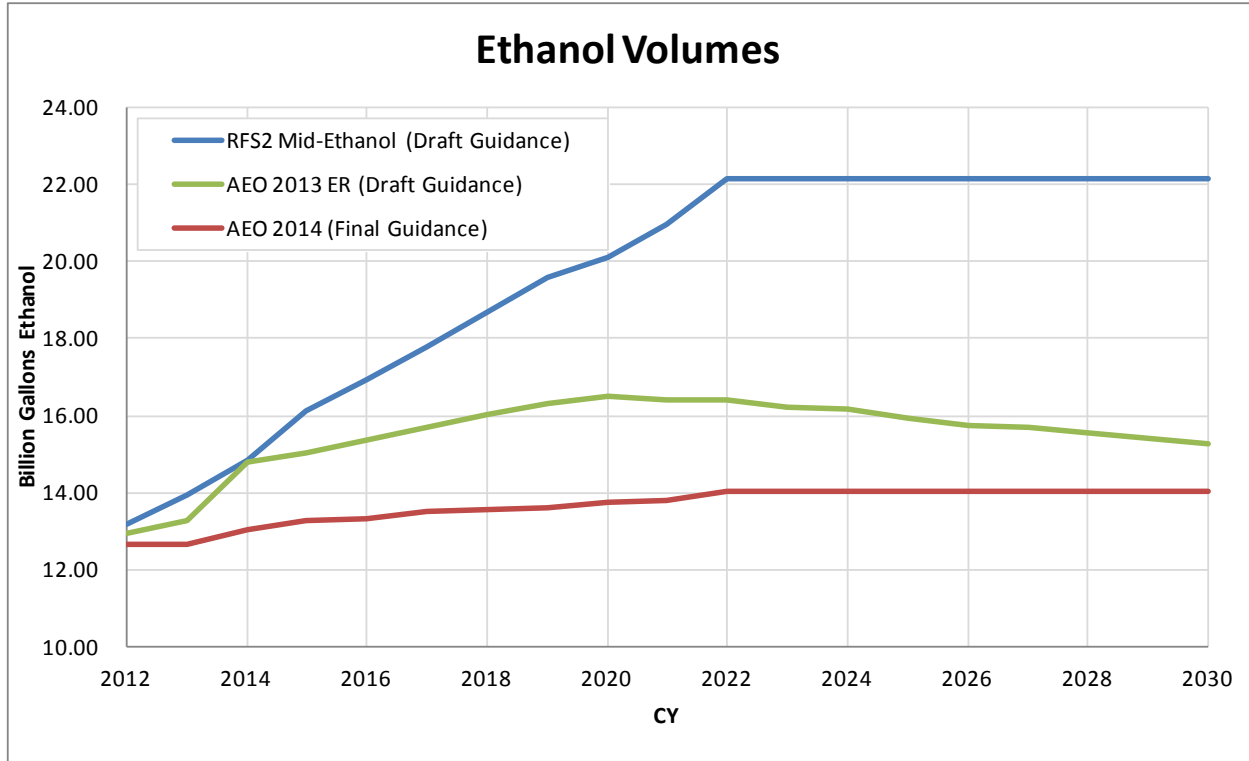
The AEO 2014 projections are based on EIA's best estimate of what will occur in the market. They are well below EPA's prior projections in the 2010 RFS rule, and even lower than EIA's other recent projections as shown in the figure below. EIA attributes the shortfall largely to the decline in overall gasoline consumption as a result of increasingly stringent CAFE standards and updated projections of FFV sales.

EPA received comments from ICCT and UCS that drop-in fuels must be considered in projecting ethanol volumes. AEO 2014 includes projections for increased use of biobutanol and drop-in fuels, which is directionally responsive to these comments.²⁶

²⁵ See Table 11 of AEO 2014 for projected ethanol volumes.

²⁶ U.S. Energy Information Administration Annual Energy Outlook 2014, DOE/EIA-0383 (2014), April 2014, p. MT-29

Figure 7 – Ethanol Volumes Including AEO 2014



4.1.4. Ethanol Use Scenarios

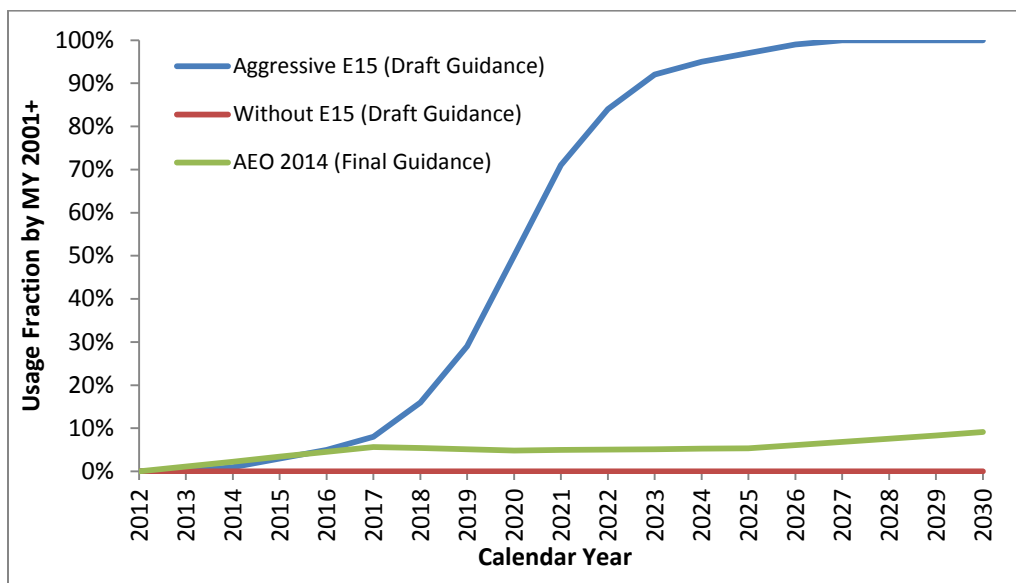
In addition to overall ethanol volume there is also uncertainty regarding how much ethanol may be consumed as E15. Currently, E15 is being consumed in very small volumes but it has been on the market for only a short time and availability is still very limited. For a specified volume of total ethanol, if E15 use grows significantly, the amount of ethanol consumed as E85 would necessarily decrease, thus resulting in a lower F factor. Therefore, the amount of E15 potentially consumed in the future is another significant point of uncertainty for EPA’s analysis. In an attempt to bracket the potential ethanol use in the future, we considered two different allocations of ethanol for the draft guidance analysis: an aggressive E15 case, and a case that assumes no E15 usage, as shown in the figure below.

The aggressive E15 case assumed increased E15 use to 50% by 2020 (for MY2001+ non-FFV vehicles). Farther into the future, we assumed E15 use increased substantially for MY2001+ non-FFV vehicles, reaching a usage of 95% by 2025. Any remaining E10 in the fuel supply for this case was consumed almost entirely in non-road, marine and off-road vehicles and equipment. In the second case included in the draft guidance, E15 was not considered as a blend. Any ethanol beyond blending at an E10 level would be used in FFVs. We did not consider scenarios that included other ethanol blends, such as E30 use in FFVs for the purposes of this analysis.

EPA received a range of comments on the E15 projections. Growth Energy, RFA, the National Corn Growers Association, and Illinois RFA commented that projected E15 use should not be included in the analysis. Growth Energy commented that all ethanol above E10 should be counted as E85 to give GHG credits to manufacturers for the use of the fuel. RFA commented that due to current issues and uncertainty regarding the use of E15, E15 scenarios should not be included. The Alliance did not comment on including both the no E15 and the E15 scenarios but did comment that the analysis should be updated to reflect actual E15 use when the F factor is updated in the future. UCS commented that the E15 scenarios should be retained and that EPA should consider increasing their weighting due to the potential for butanol, E30, and other biofuels that could reduce or even eliminate the potential sales of E85.

EPA has considered the above comments and for the final analysis we are not including the aggressive E15 projections used in the draft guidance. EPA continues to believe that including an aggressive E15 scenario may have been appropriate if EPA were retaining the RFS ethanol volume scenarios as part of the analysis. With the higher total ethanol volumes it would be reasonable to include aggressive E15 projections as a potential mechanism for consuming these high ethanol levels, or as a surrogate for a variety of other potential fuels as suggested by UCS. However, EPA is using AEO 2014 projected ethanol volumes which are significantly lower than the RFS mid-case total ethanol projections. AEO 2014 provides projections for E15 use which are coupled with AEO’s overall lower ethanol use projections. The E15 levels are projected to stay below 10% through 2030, as shown in the figure below. For the final guidance analysis, EPA is using the E15 projections that are calculated from AEO 2014, as they are consistent with AEO’s projected total ethanol levels.

Figure 8 – Projected E15 Usage Fraction



We assume that each gallon of E85 is 83% ethanol. While inconsistent with market practices,²⁷ this assures alignment between the emissions test which relies on E85 certification fuel with 83% ethanol and the analytic assumptions made here. This is also for this reason that EPA is not counting E15 as E85 used in FFVs, as suggested by Growth Energy. The F factor is used to weight the vehicle's CO₂ emissions on E85 with the emissions on conventional certification fuel for purposes of vehicle certification. The F-factor is to be based on EPA's assessment of the use of E85 alternative fuel so that these emissions values may be appropriately weighted. Further, E15 may be used in 2001 and newer non-FFVs and there is no assurance that it will be used in FFVs, whereas E85 must be used in FFVs.

4.1.4.1. Infrastructure

The AEO 2014 projections assume that infrastructure issues will continue to be gradually resolved over time.²⁸ The number of E85 retail outlets needed to meet AEO projections is much more in line with current infrastructure growth rates compared with the infrastructure needs estimated in the RFS2 final rule (at least 23,000 stations by 2022).²⁹ While the number of retail stations that dispense E85 would need to continue to increase to meet the AEO 2014 projections, we believe that such increases are within the capabilities of the industry.

4.2. Limits of this Analysis

This analysis is limited by the quality of its input projections, where there is varying certainty about the inputs. We also assume that the E85 consumption is an equivalent fraction of each MY's FFV fuel consumption during each calendar year. For example, in calendar year (CY) 2020, MY 2020 and MY2007 vehicles consume different amounts of energy (proportional to their VMT and efficiencies), but all onroad FFVs consume the same fraction of that energy as E85.

4.3. Results

The CY results are weighted by the survival weighted VMT accumulation rate of MY 2016 vehicles over the first 15 years of life (approximately 80-85% of projected lifetime driving depending on whether cars or trucks are considered).³⁰ Focusing on the first fifteen years (through 2030) is neither a clearly conservative or aggressive assumption, as it depends on the relationship between ethanol production and consumption in later years and earlier years. However, focusing on the first fifteen years allows us to limit the need to project the far future.

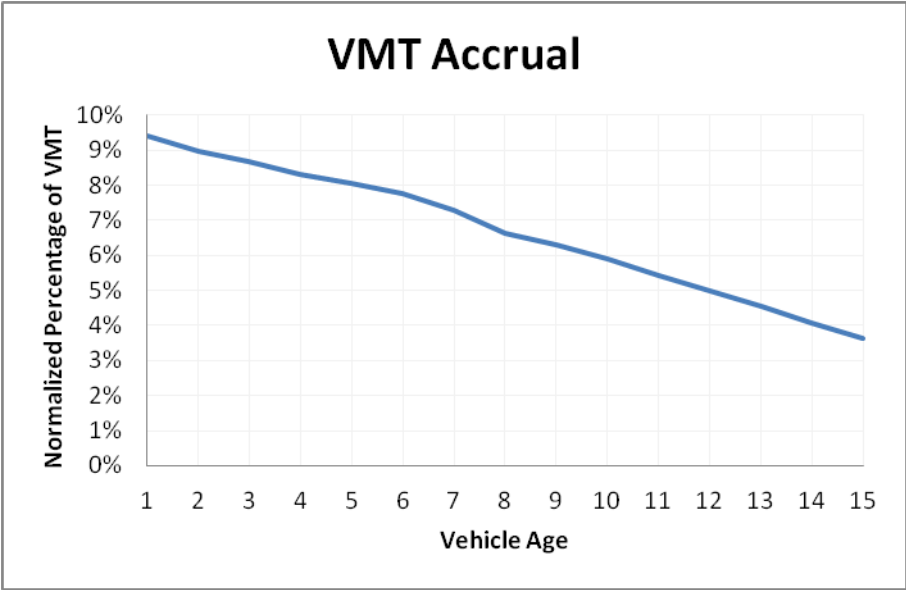
²⁷ Actual E85 average ethanol fraction is likely closer to 74%. See footnote 157 at 75 FR 14762 (March 26, 2010).

²⁸ U.S. Energy Information Administration Annual Energy Outlook 2014, DOE/EIA-0383 (2014), April 2014, p. MT-31.

²⁹ See 75 FR 14758 – 14759 (March 26, 2010).

³⁰ EPA Final Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards Regulatory Impact Analysis.
<http://www.epa.gov/omswww/climate/regulations/420r10009.pdf>

Figure 9 – VMT Weighting



For the draft guidance, we assessed two different ethanol volume scenarios, two different ethanol usage scenarios, and three different sales scenarios leading to a total of 12 scenarios. We ran the OMEGA model using each combination of the assumptions above, and calculated an F factor for each CY. This F factor was weighted by the VMT accrual rate shown above (Figure 9), and calculated for each scenario (Table 2).³¹

³¹ The VMT accrual rate shown here is a production weighted mix of cars and trucks. While the VMT for cars and trucks differ, their relative accrual rates do not significantly differ, and for simplicity, a single rate is used.

Table 2 – VMT Weighted MY 2016 F Factors

Draft Guidance				
	Ethanol Scenario	Use Scenario	FFV Sales Scenario	F Factor
1	RFS2	E15	Higher	21%
2			Middle	25%
3			Lower	32%
4		No E15	Higher	32%
5			Middle	39%
6			Lower	49%
7	AEO2013ER	E15	Higher	6%
8			Middle	6%
9			Lower	7%
10		No E15	Higher	16%
11			Middle	19%
12			Lower	23%
Average	--	--	--	23%

Final Guidance				
	Ethanol Scenario	E15 Use Scenario	FFV Sales Scenario	F Factor
1	AEO 2014 (See Figure 7)	AEO 2014 (See Figure 8)	AEO 2014 (11%)	14%

For the draft guidance, rather than selecting one of the scenarios above as a primary analysis on which to base the MY 2016 F factor, EPA averaged all of the scenarios producing an F factor of 0.23. To be conservative on the side of environmental protection in light of the uncertainty in the analysis, EPA rounded this draft value down to 0.2 for MY 2016.

For the final guidance, EPA has based the F factor of 0.14 on a single scenario based on AEO 2014 projections for ethanol volume, E15 use, and FFV sales for the reasons discussed above. Although lower than the draft F factor of 0.2, the 0.14 factor represents about a fourteen fold increase in the factor over time compared to current E85 usage rates. The F factor analysis was conducted for MY 2016 but EPA is allowing the 0.14 factor to be used for MYs 2017-2018 as well. EPA does not believe the assessment of this value would change significantly in this time frame and therefore in order to provide as much certainty and leadtime as possible to manufacturers we are fixing the value at 0.14 for MY 2016-2018.

EPA plans to revisit the weighting factor for MY 2019 and later. EPA will conduct a new analysis considering available data in establishing the value for MY 2019. In the draft guidance, EPA considered allowing the 0.2 F factor to be used through MY 2019 unless available data suggested a revision was needed sooner. However, EPA received comments that the F factor should be locked-in as far out as possible, and not be subject to review and possible revision, in

order to provide manufacturers with as much certainty as possible. EPA understands these concerns and is locking in the 0.14 F factor for MYs 2016-2018. EPA also received comments that the F factor should only be set for MY 2016 and reevaluated for model years after 2016 when additional data on ethanol volumes and E85 use is available. However, EPA is balancing the manufacturers' need for certainty with uncertainty regarding future ethanol use and FFV sales. Therefore, EPA believes that it is reasonable to revisit the F factor for the 2019 model year.

5. Comments Beyond the Scope of the Guidance Document

Several commenters submitted comments regarding the need to provide incentives for the sale of FFVs in support of the RFS program. EPA believes these comments are beyond the scope of the guidance document. In the MY 2012-2016 rule, EPA established regulations that moved away from non-performance based credits for FFVs to a system where credits are based on measured CO₂ performance weighted by estimated real-world use of those fuels.³² In the MY 2017-2025 rule, EPA received comments that FFVs should be provided additional incentives to encourage their production. EPA declined to make changes to the program during the MY 2017-2025 rule that would provide additional incentives for FFV production.³³ The policy question of whether or not FFV's should be provided with additional incentives was thus already addressed by both light-duty GHG rulemakings.

This guidance document is narrow in scope and is being undertaken per the regulations established in the MY 2012-2016 rule that EPA "will determine and publish by written guidance an appropriate value of F for each requested alternative fuel based on the Administrator's assessment of real-world use of the alternative fuel" (see 40 CFR 600.510-12(k)(1)). Therefore, EPA believes that providing credits that go beyond those that can be justified based on the Administrator's assessment of real-world use of the alternative fuel is not allowed under the regulations. EPA does not believe that this guidance can be used as a vehicle to revisit the appropriateness of, or introduce a pathway for, providing additional incentives for FFV production.

6. Conclusion

EPA is establishing the E85 weighting factor to be used by manufacturers in weighting CO₂ emissions on E85 and conventional gasoline for purposes of FFV certification. The F factor is based on the assessment of real-world fuel use over the life of the average FFV. Because the factor represents a real world assessment of the E85 used by an FFV over its lifetime, EPA must base the F factor on projections of future ethanol use and FFV production. EPA is establishing an F factor on 0.14 for MYs 2016-2018 based on AEO 2014 projections for FFV sales, total ethanol use, and ethanol blends. The 0.14 factor may not be used beyond MY 2018. EPA will take action to establish F factors for MY 2019 and later based on a full review of updated information. EPA also notes that manufacturers choosing to use a weighting factor in a given

³² 75 FR 25432-25434 (May 7, 2010).

³³ 77 FR 62822-62824 (October 15, 2012).

model year must use that weighting factor for the alternative fuel for all of their FFVs including any that have worse CO₂ emissions performance on E85. Otherwise, the default is to base FFV emissions only on conventional gasoline.