IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA

NATIONAL CHICKEN COUNCIL, *et al.*, Petitioners,	)	
v.	)	No. 10-1107 and consolidated cases
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, Respondent.	)	

DECLARATION OF STEPHEN G. BRICK

Dane County)
)
State of Wisconsin)

I, Stephen G. Brick, hereby declare and state under penalty of perjury the following:

1. This declaration is based on my personal knowledge. I am over the age of 18 and suffer from no legal incapacity. I submit this declaration in support of the petition for review of Friends of the Earth, Inc. challenging the rule "Regulation of Fuels and Fuel Additives: Changes to Renewable Fuel Standard Program", 75 Fed. Reg. 14,670 (Mar. 26, 2010) ("RFS2 regulations"), promulgated by the United States Environmental Protection Agency ("EPA"), which

implements portions of the Energy Independence and Security Act of 2007, Pub. L. 110-140, §202, 121 Stat. 1492, 1521 (December 19, 2007) ("EISA").

2. I live at 5714 Tolman Terrace, Madison, Wisconsin 53711-3443. I received a Bachelor of Arts in U.S. History from the University of Wisconsin in 1979 and received a Master of Science in Energy Analysis and Policy from the Gaylord Nelson Institute of Environmental Studies at the University of Wisconsin in 1989. For the past 30 years, my work has focused on various aspects of energy, climate change, and air quality policy, as well as other environmental issues. Most recently, from March 2009 to the present, I have served as Senior Fellow on Climate and Energy at the Chicago Council on Global Affairs. In that capacity, I direct efforts to develop a regional program on climate and energy policy, and I also assist private and nonprofit clients in matters pertaining to energy economics, energy efficiency, environmental policy, and utility regulatory and technology assessment issues.

3. From November 2005 to March 2009, I served as Environmental Program Manager at The Joyce Foundation. My responsibilities included oversight of a 10 million dollar per year environmental program, which focused on energy, global warming, Great Lakes protection, and river restoration. I also managed the foundation's initiative to accelerate development of integrated gasification combined cycle technology in the Midwest. I also was charged with

evaluating all aspects of the foundation's environmental program and to design and recommend new program strategies.

4. From September 2002 to November 2005, I served as Associate Director for Research and Technical Programs at The Energy Center for Wisconsin. There I directed the work of 15 engineers and economists employed on a variety of projects related to energy efficiency, renewable energy, and new energy technologies. In addition, I conducted due diligence on a wide variety of early stage technologies and worked with academics and others to support commercialization of such efforts. I also advised state and regional policy-makers on a range of energy and environmental issues.

5. I served as the Director of External Relations and Environmental Affairs for PG&E National Energy Group from July 1998 to September 2002. In that capacity, I analyzed the potential economic impacts of future environmental legislation on existing fossil fuel plants as part of acquisition due diligence. I also coordinated environmental permitting and regulatory licensing for development of combined-cycle power plants in Wisconsin and Illinois. In addition, I managed state and local government relations for power plant developments in Wisconsin and Illinois.

6. From September 1996 to 1998, I served as Technical Director for the Clean Air Task Force, in which capacity I conducted technical and economic

analyses of a wide range of state and national air quality policies and developed an analytic approach for analyzing costs and benefits of eliminating of old-new source distinction in national air quality policies, which ultimately supported the passage of the Clean Air Interstate Rule. From 1988 to 1996, I was Vice President of MSB Energy Associates, which serves a wide range of public and private clients with regard to utility economic and environmental regulations.

7. From 1979 to 1988, I worked for the Wisconsin Legislature, Resource Management Associates (consulting), and the Wisconsin Public Service Commission.

8. The purpose of this declaration is to respond to EPA's analysis and conclusion in the RFS2 regulations that corn ethanol made from facilities that commenced construction on or after December 17, 2007, will meet the 20 percent greenhouse gas ("GHG") reduction threshold as compared to gasoline produced in 2005 (which EPA refers to as "baseline gasoline"), as specified in EISA.

9. EPA analyzed the lifecycle GHG emissions associated with corn ethanol based on the expected performance – including technological innovations and efficiency and yield improvements – of the corn ethanol industry in the year 2022; in other words, EPA used 2022 as the starting point from which its assesses lifecycle GHG emissions. It then analyzed the lifecycle GHG emissions associated with biofuels over the subsequent 30 years (from 2022 to 2052) and compared

them to the GHG emissions that would result from the production and use of baseline gasoline over that same period. Using this approach, EPA concluded that corn ethanol would have 21 percent less GHG emissions than the baseline gasoline on a lifecycle basis.

10. As explained below, however, EPA projects that, pursuant to the requirements in EISA, around 40 billion gallons of new corn ethanol will be produced and consumed between 2010 and 2021.[1] EPA projects that, as a result of EISA, the annual production and consumption of corn ethanol in the United States will increase by 4.5 billion gallons during 2010 to 2015 (rising from 10.5 billion gallons in 2009 to 15 billion gallons in 2015, which is the full increment available to conventional corn ethanol under EISA).[2] Between 2016 and 2021, during each year, 4.5 billion gallons of ethanol will continue to be added. Therefore, EPA could have conducted the 30-year assessment of lifecycle GHG emissions for corn ethanol beginning in the year that the fuel is produced – for instance, EPA could have analyzed the net GHG emissions from incremental corn ethanol beginning in 2010 and ending in 2044. 2044 would be the end of the 30-year span for new ethanol produced in 2015. The 2010 to 2044 window is needed to capture the full

[1] These numbers are derived from Table 1 in Section II below. When the amounts in the farthest right hand column (cumulative increases in corn ethanol) are summed and then an additional 4.5 billion gallons is added every year between 2016 and 2021, the sum is 40 billion gallons of new corn ethanol production.

[2] See Table 1 in Section II below.

effects of corn ethanol additions occurring from 2010-2015. Instead, EPA began its analysis in 2022, well after the point at which EPA expects that the industry will stop adding new corn ethanol production capacity.

11. By using the year 2022 as a starting point, EPA concludes that corn ethanol will meet the 20 percent GHG reduction threshold in EISA. In fact, when the lifecycle GHG emissions from corn ethanol are analyzed 30 years out from the period in which EPA projects that new corn ethanol capacity will come online in compliance with EISA (2010 to 2015) net emissions per metric in 2044 will be approximately *28 percent higher* than the emissions that would have resulted from the use of baseline gasoline over that same period. Therefore, if EPA had conducted the lifecycle GHG analyses in accordance with its own real-world projections regarding corn ethanol production, it would have concluded that corn ethanol produced by newly built facilities in 2010 to 2015 is not a qualifying fuel under the RFS2 regulations.

12. In preparing this declaration, I have reviewed the following information:

- EPA, "Regulation of Fuel and Fuel Additives: Changes to Renewable Fuel Standard Program" at 75 Fed. Reg. 14,670 (Mar. 26, 2010);
- EPA, "The Renewable Fuel Standard 2 Regulatory Impact Analysis" (February 2010), *available at* http://www.regulations.gov/search/Regs/home.html#home

(Document ID No. EPA-HQ-OAR-2009-0472-1132) ("RFS2 Regulatory Impact Analysis"); and

- EPA, Docket ID No. EPA-HQ-OAR-2005-0161-3173.5(1), *available at* http://www.regulations.gov/search/Regs/home.html#docketDetail?R=EPA-HQ-OAR-2005-0161 ("Spreadsheet EPA-HQ-OAR-2005-0161.3173.5(1)").

13. At the outset, I would like to emphasize that my analysis and conclusions are based exclusively on the assumptions that EPA itself used in analyzing the GHG implications of corn ethanol in promulgating the RFS2 regulations. The only parameter I changed was the 30-year period being analyzed. Instead of analyzing the net emissions from corn ethanol over 30 years starting in 2022 (as EPA did), I relied upon EPA's assumption that the additional 4.5 billion gallons of corn ethanol capacity that EPA projects will be added as a result of EISA will come online during 2010 to 2015. Therefore, I analyzed the lifecycle GHG emissions from that additional corn ethanol capacity through 2044 (30 years after industry finishes adding new corn ethanol capacity pursuant to the requirements of EISA).

I. EPA's Assumptions and Methodology in Calculating the Lifecycle GHG Emissions of Corn Ethanol

14. In the RFS2 regulations, EPA concluded that corn ethanol meets the 20 percent GHG reduction requirement in EISA, as compared to the gasoline

baseline. Specifically, EPA found that corn ethanol produced in newly-built facilities results in lifecycle GHG emissions that are 21 percent lower than gasoline. 75 Fed. Reg. at 14,786. EPA begins its lifecycle GHG analysis for corn ethanol in 2022 (when EISA's full 36 billion gallon biofuels mandate is supposed to be fully attained), and considers the net flux in GHG emissions over the subsequent 30 years – that is, from 2022 to 2052.

15. EISA mandates an increase in the use of 4 types of biofuels: "advanced biofuel," "cellulosic biofuel," "biomass-based diesel," plus a catch-all category called "renewable fuel". EPA writes, "Although there is not a set corn ethanol requirement, EISA allows for 15 billion gallons of the 36-billion gallon renewable fuel standard to be met by conventional biofuels." 75 Fed. Reg. at 14,746. The agency expects "that corn ethanol will fulfill this requirement," *id.*, meaning that the corn ethanol industry will add 4.5 billion gallons in annual production capacity between 2009, when annual production was 10.5 billion gallons, and 2015 (when the "effective limit for participation in the RFS program of 15Bg of corn ethanol" is reached). *See* 75 Fed. Reg. at 14,743; RFS2 Regulatory Impact Analysis §1.2.2 (Table 1.2-3). 2010 is the first year that new corn ethanol will be added. According to EPA's assumptions set forth in Table I.A.1-I, corn ethanol from the newly built facilities first comes into the market in 2010. The amount of ethanol produced and sold by those facilities grows each

year through 2015, when the last new increment is assumed to be added. Thereafter, the amount of corn ethanol produced by the new facilities remains flat at 4.5 billion gallons per year, with 4.5 billion gallons being added each year between 2016 and 2021. Emissions from this new corn ethanol production capacity will necessarily start occurring in 2010. Therefore, using the 30-year timeframe, the actual lifecycle of the GHG emissions associated with new corn ethanol could have been analyzed beginning in 2010, not 2022.

16. EPA modeled the lifecycle GHG estimates of corn ethanol during the 30 years subsequent to 2022. Based on this analysis, EPA concluded that corn ethanol would meet the 20 percent GHG reduction threshold of EISA – estimating, based on 2022 as a starting year, that corn ethanol will achieve a 21 percent GHG reduction as compared to fossil fuel based transportation fuel used in 2005.

II. Using the Correct Baseline Year Demonstrates that Corn Ethanol Actually *Increases* GHG Emissions

17. EPA's analysis and the conclusion that corn ethanol will achieve the required GHG emissions reductions is based on an analysis that ignores the agency's own projections that, pursuant to EISA, almost 40 billion gallons of new corn ethanol will be produced and consumed prior to 2022, and that corn ethanol production capacity will stop expanding by 2015. *See* Table 1 below and footnote 1 of this declaration. (The data in Table 1, which show the annual and cumulative

additions of conventional corn ethanol capacity under EISA, are derived from Table I.A.1-1 in the RFS2 regulations, 75 Fed. Reg. at 14,674.) Rather, EPA could have analyzed the GHG emissions starting in the year in which corn ethanol is produced, as I do here.

18. Using 2022 as the starting point for the lifecycle analysis severely underestimates the net GHG emissions associated with new corn ethanol in the near term. When the lifecycle analysis is performed using the year of production as the starting point, it becomes clear that new corn ethanol not only fails to meet the 20 percent GHG reduction threshold, it actually increases GHG emissions as compared to gasoline.

19. Beginning the lifecycle GHG analysis in 2022, rather than when the fuels are produced and consumed avoids this result. Two important factors account for this:

- EPA assumes that lifecycle international indirect land use change (ILUC) emissions in 2022 are 60 percent lower than present ILUC emissions. Spreadsheet EPA-HQ-OAR-2005-0161.3173.5(1). The agency's analytic approach largely obscures the effect of ILUC.
- EPA assumes that ethanol production emissions in 2022 are 13 percent lower than present production emissions. Spreadsheet EPA-HQ-OAR-2005-0161.3173.5(1).

20. The analysis set forth below compares corn ethanol lifecycle GHG emissions over 30 years as compared to those arising from the equivalent amount

of gasoline and demonstrates that the emissions from corn ethanol are approximately twenty-eight percent higher. Again, all of the assumptions used to develop this analysis are EPA's; the only difference is the time period being analyzed (my analysis starts in 2010, whereas EPA's analysis starts in 2022). The data in Table 1 are derived from Table I.A.1-1 in the RFS2 Regulations,75 Fed. Reg. at 14,674. According to EPA, new corn ethanol production will grow by a total of 4.5 billion gallons between 2010 and 2015.

Table 1: Additions of new corn ethanol

	Total Available Corn Ethanol Volume (billion gallons)	Incremental Increase (billion gallons)	Cumulative Increase (billion gallons)
2009	10.5		
2010	12	1.5	1.5
2011	12.6	.60	2.1
2012	13.2	.60	2.7
2013	13.8	.60	3.3
2014	14.4	.60	3.9
2015	15	.60	4.5

21. EPA corn ethanol emission rates assume that ethanol refineries are natural gas fired, and that 63 percent of the plants produce dry distillers grains and 37 percent produce wet distillers grains. Emission data below are derived from the EPA spreadsheet used to calculate corn ethanol lifecycle emissions. Spreadsheet EPA-HQ-OAR-2005-0161-3173.5(1).

22. Table 2 below summarizes the emission assumptions used in this analysis (which mirror the assumptions used by EPA in its analysis). First year emissions are highest because of the initial indirect land use change ("ILUC") driven by increased demand for ethanol in the U.S. In years 2 to 19 lower ILUC emissions are assumed, and in years 20 to 29 ILUC emissions are lower still. Spreadsheet EPA-HQ-OAR-2005-0161.3173.5(1). The composite emission rates in the third column reflect the weighting between the processes that produce dry distillers grains and those that produce wet distillers grains, as described above.

Table 2: Emission rates used in this analysis (Calculations derived from Spreadsheet EPA-HQ-OAR-2005-0161.3173.5(1))

	Annual Emission rate (g CO_2e per mmBtu)		
	Dry Distillers Grains	Wet Distillers Grains	Composite
First year	1,721,152	1,709,111	1,716,697
Years 2-19	86,574	74,533	82,119
Years 20-29	56,276	44,236	51,821
Gasoline			98,204

23. Total emissions are heavily front-loaded because for each year that new ethanol production is added, there is an initial large pulse of ILUC emissions. Table 3 below presents corn ethanol emissions for 2010-2016. 2016 is the first year that new ethanol is not added, which accounts for the substantial drop in emissions. Figure 1 below presents these same data graphically, alongside

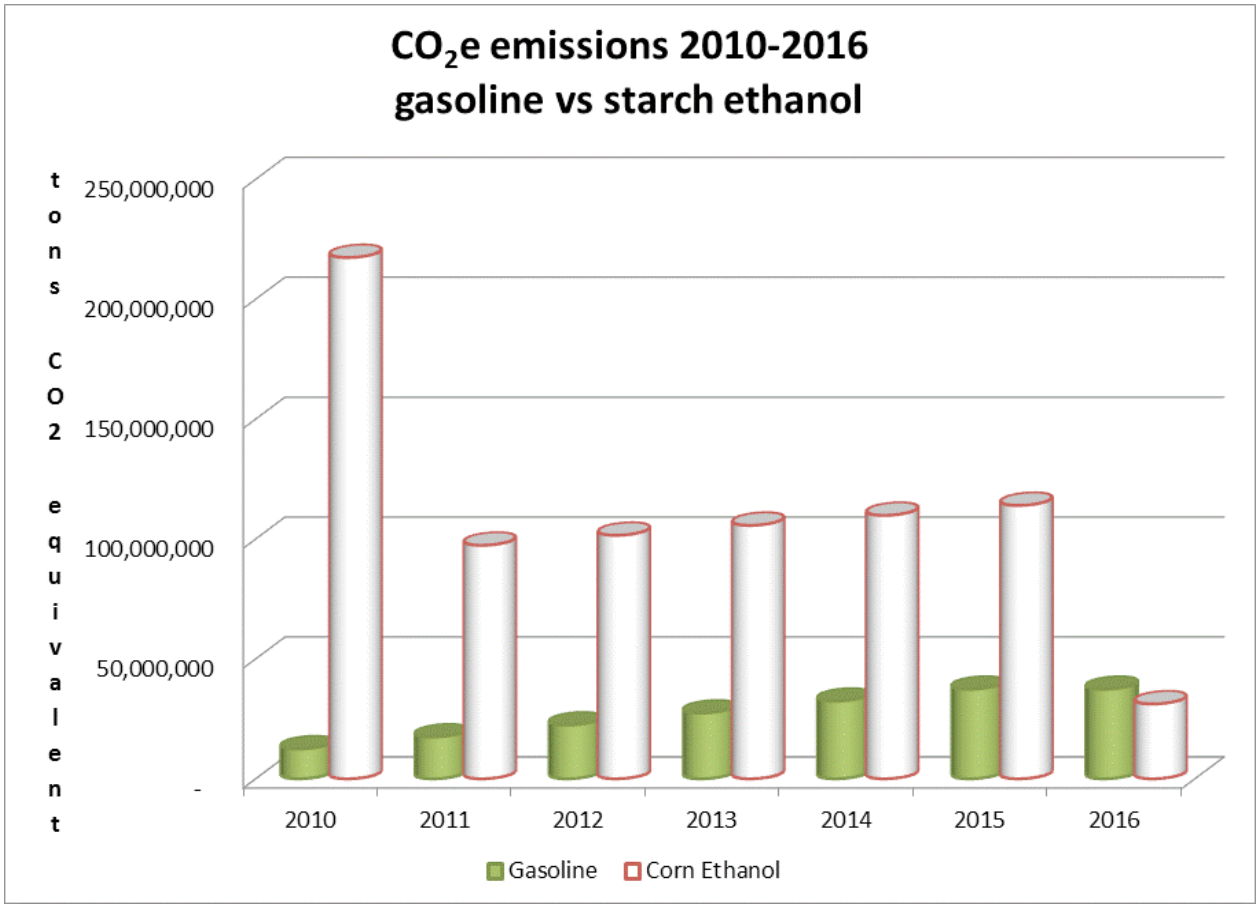
comparable emissions from an energy equivalent amount of gasoline. The volumes on which this figure is based are presented in Table 1, above.

24. As Table 3 and Figure 1 demonstrate, by 2015, corn ethanol will have added 745 million tons of carbon dioxide equivalent ("CO_2e") to the atmosphere in contrast to 149 million tons arising from an energy equivalent amount of gasoline.

Table 3: Emissions from new corn ethanol and an energy equivalent amount of gasoline 2010-2016 (tons CO_2e)

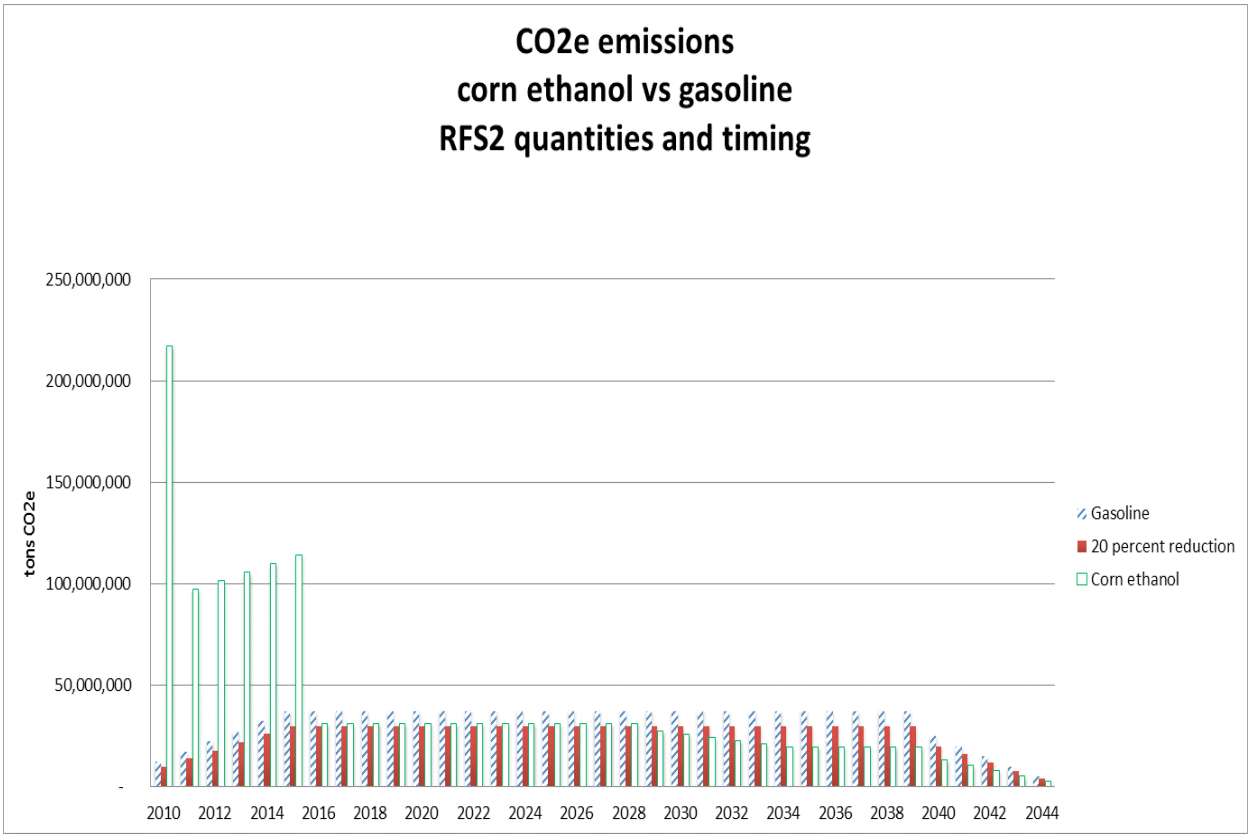
	Gasoline	Corn Ethanol
2010	12,432,626	217,333,714
2011	17,405,677	97,329,751
2012	22,378,728	101,488,257
2013	27,351,778	105,646,763
2014	32,324,829	109,805,269
2015	37,297,879	113,963,775
2016	37,297,879	31,188,796
7-Year Cumulative	149 MT	745MT

Figure 1 (Calculations derived from Spreadsheet EPA-HQ-OAR-2005-0161.3173.5(1))



25. Figure 2 below presents year-by-year GHG emissions for corn ethanol and baseline gasoline, from 2010 through 2044. A 20 percent reduction below the baseline gasoline emissions level is also shown.

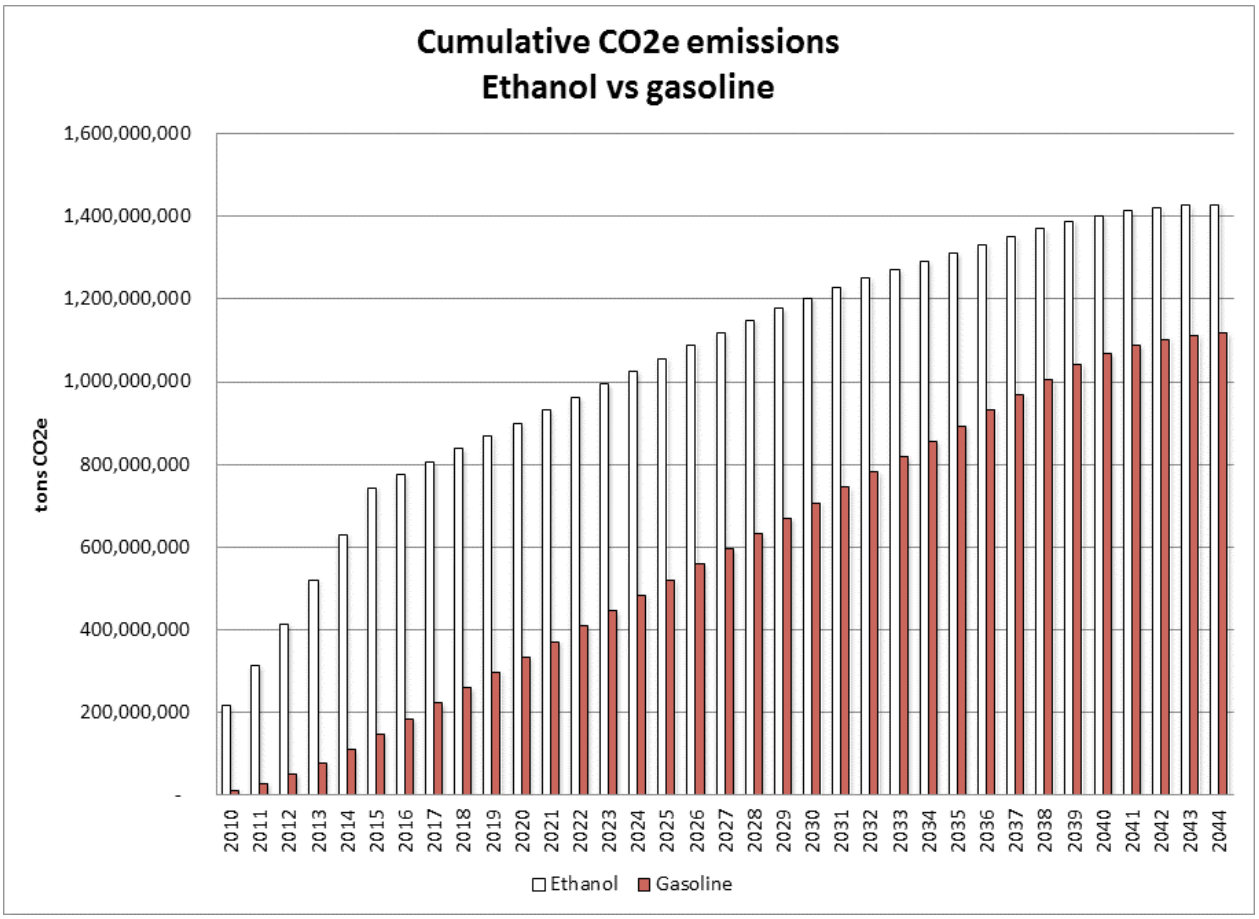
Figure 2



26. Figure 3 below presents the cumulative emissions from the period 2010-2044 from corn ethanol and gasoline. This analysis is carried though 2044 to capture a full 30 years of emissions from each year-class of new ethanol (i.e., the 30-year lifecycle for ethanol added ends in 2044). In 2044, cumulative GHG emissions from corn ethanol equal about 1.4 billion tons; the emissions from an energy equivalent amount of gasoline equal 1.1 billion tons. The cumulative emissions from the production and use of gasoline do not exceed those from corn ethanol until 2054. In other words, when the lifecycle analysis encompasses the years when corn ethanol production and consumption actually increases pursuant

to EISA, it shows that the GHG emissions over a 30-year period from corn ethanol are approximately 28 percent higher than those from gasoline.

Figure 3



Conclusion

27. For the reasons stated above, it is my expert opinion that EPA could have analyzed the lifecycle GHG emissions of corn ethanol using the year in which that fuel is produced as the starting year. Such an analysis demonstrates that not only will corn ethanol fail to achieve the GHG reductions required by EISA, it will actually increase GHG emissions by 28 percent above baseline gasoline. EPA's

conclusion that corn ethanol produced between 2010 and 2015 will achieve the statutory GHG reduction thresholds is based on its use of 2022 as the starting year from which to assess the lifecycle emissions of that fuel – that is 7 years after the expansion of corn ethanol production is finished. If EPA had instead used as the starting point for its analysis of new corn ethanol's lifecycle emissions the year in which the fuel is produced, it would have concluded that the corn ethanol does not meet the GHG reduction requirement established by EISA and, in fact, increases GHG emissions in the near term.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on July 28, 2011.

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