



August 4, 2009

Lisa Jackson
Administrator
Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Mail Code: 1101A
Washington, D.C. 20460

Dear Administrator Jackson:

In a letter to you dated June 1, 2009, I expressed the ethanol industry's grave concern that the documentation and data on docket # EPA-HQ-OAR-2005-0161 pertaining to EPA's lifecycle analysis for the expanded Renewable Fuels Standard (RFS2) were wholly insufficient and did not adequately allow stakeholders to understand precisely how EPA arrived at its estimates for biofuel-related greenhouse gas emissions from indirect land use changes (ILUC). We appreciate EPA's response to my earlier letter, and its efforts to provide information to the public on its proposed lifecycle analysis. We remain concerned, however, that there is still insufficient information for the public to adequately comment on the proposal and, therefore, meaningfully participate in the rulemaking process. Of particular concern, and the focus of this letter, is the inability of the public to replicate EPA's analysis with respect to international ILUC.

Among the concerns outlined in my June 1 letter was that the available information did not allow stakeholders to replicate EPA's ILUC analysis. Reproducibility is a key component of the Office of Management and Budget's (OMB), as well as EPA's, guidance on information quality. OMB provides that "agency guidelines shall generally require sufficient transparency about data and methods that an independent reanalysis could be undertaken by a qualified member of the public."¹ Transparency also ensures that the information is useful from the public's perspective.² In addition to assisting the agency in finding errors, "[t]he more important benefit of transparency is that the public will be able to assess how much an agency's analytical result hinges on the specific analytic choices made by the agency."³ Further, "[S]ensitivity analysis is widely regarded as an essential feature of high-quality analysis, yet sensitivity analysis cannot be undertaken by outside parties unless a high degree of transparency is

¹ 67 Fed. Reg. 8452, 8460 (Feb. 22, 2002).

² *Id.* at 8459.

³ *Id.* at 8456.

achieved.”⁴ With respect to use of proprietary models, EPA also recognized the need for “rigorous ‘robustness checks,’” and “transparency about the sources of data used, various assumptions employed, analytic methods applied, and statistical procedures employed should assure that analytic results are ‘capable of being substantially reproduced.’”⁵ EPA guidance further states, “Experimental replication is possible when information about modeling processes is properly and adequately communicated.”⁶

The best and most common way for a stakeholder to understand how a model is being used by a public agency in a public rulemaking process is for the stakeholder to physically reproduce the agency’s results. This is accomplished by actually running the same model used by the agency and using all of the exact same input assumptions and model settings. Once the stakeholder is able to successfully replicate the agency’s modeling results, it may then comment in an informed manner on the agency’s use of the model. Successful replication of the agency’s results also enables the stakeholder to better understand what factors have the most influence on modeling outcomes, which then provides the basis for the stakeholder to identify the key issues, to conduct sensitivity analyses, and to meaningfully comment on EPA’s analysis.

One of the specific concerns outlined in my letter was that the Food and Agriculture Policy Research Institute (FAPRI) system of models as configured and used by EPA was not available for public use.⁷ Therefore, stakeholders were unable to replicate EPA’s work. As such, we requested that the FAPRI model itself and all associated materials be made available so that stakeholders could “run” the model to replicate EPA’s results and to conduct sensitivity analyses. Presumably in response to our letter, several dozen spreadsheets and documents containing model inputs and results were posted to the docket during the first week of June 2009. Further, in your June 8, 2009 response to our concerns, EPA suggested that the “...FAPRI model itself as configured for our RFS2 analysis...” had been posted to the docket. On June 9, 2009, during the EPA’s public hearing on the RFS2 proposal, the agency posted “Model Access Instructions” to the docket for the FAPRI models and the Forest and Agricultural Sector Optimization Model (FASOM) (EPA-HQ-OAR-2005-0161-0968).

The information provided by EPA does not allow the public to replicate EPA’s findings. According to the docket, the FAPRI model is contained on a CD with the ID # of EPA-HQ-OAR-2005-0161-967. Upon receipt, the CD was found to contain 10 Microsoft EXCEL files, but no other documentation. Upon opening each file, the EXCEL program immediately generated an error message stating that additional information was needed from other workbooks. Examination of these missing links determined that none of the listed files and spreadsheets was

⁴ *Id.*

⁵ EPA, Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by EPA, EPA/260R-02-008, at 47 (Oct. 2002) (hereinafter referred to as “EPA IQA Guidelines”). *See also id.* at 20-21.

⁶ EPA Office of the Science Advisory, Guidance on the Development, Evaluation, and Application of Environmental Models, EPA/100/K-09/003, at 48 (Mar. 2009).

⁷ The DRIA shows that FAPRI, which is used to estimate international land use changes by EPA, is the model that drives the majority of land use change emissions. The FASOM model is used by EPA to develop domestic land use change emissions estimates, but these emissions have a far smaller impact on the overall analysis than the international land use change emissions resulting from the FAPRI analysis. Thus, this letter focuses primarily on the FAPRI model.

included on the CD. Indeed, some of these files were even referenced by inaccessible web addresses. Since these auxiliary files are missing, EXCEL only allows the user to “Edit”, “Update”, or “Ignore” these links. In this situation, the “Edit” and “Update” options are invalid, since the required files are simply not available. Selecting the “Ignore” option leaves each spreadsheet in a quasi-finished state, with many incomplete cells and equations, broken executables (macros), etc. Consequently, the FAPRI system, as delivered on the CD, is inoperable and insufficient to explain how EPA reached its results.

A subsequent document posted to the docket (EPA-HQ-OAR-2005-0161-1020) entitled “Solving the Food and Agriculture Policy Research Institute Model” provides a broad overview of the FAPRI modeling system. It explains that the 10 spreadsheets on the CD are interrelated, whereby calculations and data generated by each spreadsheet are required by one or more other spreadsheets. The location and amount of information shared by each spreadsheet varies as the system runs. Moreover, the system requires that these spreadsheets be set up and executed in a certain manner and order, both of which can change as the system tries to reach “equilibrium” (where supply and demand are in balance). Unfortunately, the document does not give any information regarding how to set up or run the spreadsheets, what data needs to be shared between them, or how to determine when the system has reached “equilibrium.” As a result, the FAPRI system is still inoperable by stakeholders. In investigating the issue further and discussing the model’s configuration with professors at Iowa State University, we learned that due to the structural nature of the FAPRI model, *no one outside of the FAPRI/CARD system can actually “run” the model in the way that it was run for EPA’s analysis.* Thus, it appears the only way to conduct independent FAPRI model runs and sensitivity analysis is to establish a contract with FAPRI/CARD. For obvious reasons, this is of great concern to us.

EPA staff has been helpful and responsive in attempting to answer our questions and providing the data that are fed into the FAPRI model and the output data that is generated by the model. However, because the model is inaccessible to run by anyone other than current FAPRI/CARD staff in the same manner that it was run for EPA, the FAPRI model results cannot be verified and, moreover, lack corroboration and validity. While we are not questioning the integrity or acumen of the FAPRI modelers who conducted the EPA analysis, the results do not have the same level of validity that they would if someone outside of the CARD/FAPRI system were able to replicate the results.

The inability to replicate EPA’s FAPRI model results greatly weakens the capacity of stakeholders to provide meaningful comment. Stakeholder feedback is particularly important in this case, due to the fact that EPA’s approach to lifecycle analysis for this rulemaking is unprecedented, complex, and controversial. Further, the inability of stakeholders to conduct sensitivity runs is particularly problematic because EPA did not conduct any sensitivity analyses of its own on the effects of various inputs on land use emissions with the FAPRI model. In addition to providing sufficient information to allow the public to replicate EPA’s analysis, EPA also must “apply especially rigorous robustness checks to analytical results and carefully document all checks that were undertaken.”⁸ Therefore, we are requesting that robust sensitivity analysis of the impacts of various input variables on land use emissions be conducted. We also

⁸ EPA IQA Guidelines at 21.

request that EPA provide the results of these sensitivity runs to the public for their review and comment, as well as any changes to its analysis and results that EPA anticipates for the final rule. At a minimum, we believe sensitivity runs should be conducted and provided to the public on the following major factors:

- Projected domestic and international crop yields
- Distillers grains (DG) displacement ratios and ingredients displaced
- Conservation Reserve Program (CRP) and cropland pasture land inventories
- Pasture stocking rates in Brazil

A more thorough description of these factors and others, as well as the desired EPA sensitivity analysis is available in Attachment 1 to this letter. Ultimately, however, the lack of reproducibility of EPA's results, and the lack of analysis as to robustness of these results, calls into question whether the FAPRI model rises to the level of scientific validity, utility, objectivity or integrity that can be reasonably used in this type of rulemaking process.

In closing, we are highly concerned by the fact that EPA's FAPRI analysis is still not replicable by stakeholders. While we believe conducting the sensitivity analyses described above would assist the public in better understanding EPA's proposed lifecycle analysis, there remains key questions as to the usefulness of the FAPRI model in this context, including the lack of quantification of the uncertainty involved in the analysis and the lack of validation of the analysis. In particular, due to the continued inability of stakeholders to fully reproduce EPA's FAPRI model results themselves, we believe it is inappropriate at this time to use the FAPRI model to establish point estimates for international ILUC emissions in this rulemaking.

Sincerely,

A handwritten signature in black ink that reads "Bob Dinneen". The signature is written in a cursive, slightly slanted style.

Bob Dinneen
President and CEO

cc: Gina McCarthy
Assistant Administrator
Office of Air and Radiation, EPA

Margo Oge
Director, Office of Transportation and Air Quality

Sarah Dunham
Director, Transportation and Climate Division

Julia MacAllister
Office of Transportation and Air Quality, Assessment and Standards Division

EPA Air and Radiation Docket
Docket ID No. EPA-HQ-OAR-2005-0161

(Attachment 1)
SUGGESTED AREAS FOR EPA SENSITIVITY ANALYSIS

Due to the continued inability of stakeholders to physically run the FAPRI model and replicate EPA's ILUC results, the Renewable Fuels Association is requesting that EPA, at a minimum, conduct sensitivity analysis on the following factors, all of which we believe could significantly alter the model's results. These sensitivity analyses are necessary in order for the public to better understand EPA's results and how the FAPRI model works.

I. Projected domestic and international crop yields

The base case crop yields used in current EPA's modeling are USDA projections of recently observed trends. For modeling to support the proposal's economic impact analysis, EPA modeled a higher corn yield sensitivity case. Why was a higher yield sensitivity case not examined for the lifecycle emissions/land use change analysis? At a minimum, EPA should estimate the impacts of this higher corn yield case on land use emissions. We also recommend a more aggressive case using yield projections that are consistent with information and modeling conducted by leading seed companies, such as the information presented by the Monsanto Co. at EPA's June 2009 lifecycle analysis workshop.

II. Distillers grains (DG) displacement ratios and ingredients displaced

RFA analysis shows that DG displacement ratios (i.e., the ratio of the mass replacement of DG to base feed) and the percent of protein meal (primarily soybean meal) displaced in various animal diets has a significant effect on land use. This factor probably has a greater effect on land use than any other factor. We believe the best point estimates of these factors are presented in either a September 2008 Argonne National Laboratory study⁹ or a review of that study by University of Minnesota Prof. Gerald Shurson¹⁰. A comparison of the FAPRI, Argonne, and Shurson distillers grains estimates is shown in Table 1. Sensitivity cases should be conducted using these displacement figures. Further, EPA assumes a significant share of dry mill ethanol plants will be utilizing fractionation or oil separation by 2022, which could considerably alter the co-product streams from those plants. Yet, it appears EPA assumes that the co-products resulting from those processes will displace conventional feed on the same basis as conventional DG. EPA should conduct further analysis on how these new co-products are actually being fed and what conventional ingredients are being replaced.

Source	Displacement Ratio (kg DG:kg conventional feed)	% of replaced conventional feed that is soybean meal
FAPRI	1:1.00	5%
Argonne	1:1.28	24%
Shurson	1:1.22	25%

⁹ "Update of Distillers Grains Displacement Ratios for Corn Ethanol Life-Cycle Analysis", Arora, Wu, and Wang, Argonne National Laboratory, September 2008.

¹⁰ "Analysis of Current Feeding Practices of Distiller's Grains with Solubles in Livestock and Poultry Feed Relative to Land Use Credits Associated with Determining the Low Carbon Fuel Standard for Ethanol." Dr. Jerry Shurson, Professor, Department of Animal Science, University of Minnesota. March 25, 2009

III. CRP and cropland pasture land inventories

EPA's land use change modeling assumes that total CRP enrollments do not ever dip below 32 million acres. Again, EPA performed a sensitivity case for its economic impact analysis that assumed that the amount of CRP land could fall below 32 million acres. Yet, the agency performed no sensitivity analysis on the impact of this assumption on land use change emissions. It is also unclear whether certain other classes of land, such as cropland pasture, are included in the FAPRI and FASOM databases. If not, EPA should conduct sensitivity cases that include a broader land area, including cropland pasture.

IV. Pasture stocking rates in South America

The EPA land use analysis assumes that pasture converted to cropland in Brazil is made up by converting additional land to pasture elsewhere in the world. This further assumes no increase in pasture intensification, i.e., an increase in animals per unit of area. In their presentation at the EPA lifecycle analysis workshop, UNICA representatives showed compelling data demonstrating an increasing trend in pasture intensification. This should reduce the international land use impacts of corn ethanol. RFA recommends that EPA conduct additional sensitivity modeling taking this factor into account.

V. Other factors

RFA's analysis of ILUC using GTAP has identified several other factors that can have significant impact on overall results. We encourage EPA to consider sensitivity work and alternative assumptions on these additional factors, which include:

- Ethanol yield per unit of processed feedstock
- Possible price-induced yield changes
- Tillage practices on existing and newly converted cropland
- Sequestration of carbon in harvested commercial wood products (construction materials, etc.)
- Methane reduction through increased feeding of distillers grains