Review of US Environmental Protection Agency RFS-2 Rule

Several **major** problems exist relating to the US Environmental Protection Agency (US EPA) Draft RFS-2 rule. As a general overview of the entire process, it is felt that while emissions from changes in international land use may be an area of importance, it is plainly obvious that the technical and scientific arguments used by the US EPA, as well as their process of review and comment, are terribly flawed.

Background

Two major points can be made concerning the US EPA's rulemaking with respect to international land use and biofuels: 1) their reliance on a very small set of scientific data, and 2) no attempt to adequately acknowledge the myriad of global political, agricultural, economic, and human interactions that take place on a daily basis and are so intertwined that it absolutely begs for more research and time to even begin to make large-scale decisions such as they are trying make. Reliance upon a single study such as the one by Timothy Searchinger and the inclusion of other studies in his analysis that are flawed in respect to crop yields and land use change satellite data that has errors of over 50% is certainly not good science and should definitely not be used to make such broad changes in the US and possibly global biofuels industries. More importantly, it appears that the US EPA has not really made any real attempt to verify if the claims/data made in the Searchinger article have any 'real-world' validity. Other prominent researchers have 'de-bunked' some of the data and claims made in the Searchinger article and these have not been acknowledged by the US EPA.

In addition, the following are of concern with respect to the US EPA's decision-making process:

1) <u>The US EPA Peer Review Process</u>

   The Office of Management and Budget (OMB) has strict rules concerning a peer review process, especially that they include provisions for scientific and process integrity. The actions of the US EPA in this regard do not seem to follow the OMB guidance. The US EPA was to provide the peer reviewer's access to comments, etc. provided by the general public and did not (at least of this date 9/17/09). The public it appears has been excluded from the peer review process and that the peer review panels will not even have a chance to review comments, data, etc. provided by the public. Also of interest, is US EPA's ability to provide documents associated with the peer review process and as of late last week, these documents have not been made available. Without all parties that have an interest in this process and debate having access to all information, this not only makes the review extremely difficult, but also provides a backdrop that something is being hidden or withheld on purpose.

2) <u>Peer Reviewer Selection</u>

   Any peer review process ought, at a minimum, contain at least the appearance of being unbiased as to have as much of all sides of the debate represented. The US

EPA's peer review process selection seems to be terribly flawed, especially in that they (US EPA) does not actually provide the names of those that provided recommendations for serving as a peer reviewer. Also, it seems that there was no large, general request for recommendations or to even serve as a potential reviewer.

3) Peer Review Reports

In considering the peer review reports provided in the docket, there are many areas of disagreement among the peer reviewers and disagreement with the EPA's methods. No one thought EPA's choice of models was very good. Michael Wang from Argonne National Labs thought consequential lifecycle analysis was not ready for regulatory application. Timothy Searchinger thought EPA should use FAPRI but not FASOM and definitely not GTAP. Searchinger says that mingling these models gives the potential for "inconsistent results" This is a very revealing statement. If the models don't give consistent results, why should we believe either one? John Sheehan from the University of Minnesota supports using a dynamic model like STELLA rather than FASOM or FAPRI. Sheehan says, "Even with the detail that EPA has provided on its analysis using these models, it is impossible to judge with confidence what is going on in these models, what limitations in the models may be biasing the results, or what fundamental data underlying the models may be influencing the outcomes."

Reviewers mostly kept away from the numbers and focused on the methodology, so they didn't find the significant errors in data and assumptions, overlap between the models, double-counting or misalignment where models intercept. This is interesting because the feedback given by EPA in their public hearing and workshop was that they were more interested in correcting any numbers they had wrong than in discussing the methodology. EPA seemed to be quite close-minded in accepting principle flaws in their overall assumptions and methodology, but admitted they did not have the resources to ensure all data points were correct.

The peer reviewers did include discussion of EPA's error concerning N_2O emissions for soy, but failed to mention the lack of credit for glycerin as a co-product of biodiesel production.

The EPA was descriptive in asking for specific input. However, there were many additional things of which they could have and should have requested analysis, but didn't. Regardless of the questions posed, it is unrealistic to expect that the peer reviewers could delve into the details to adequately assess such a convoluted set of models and assumptions with the time and resources allotted. Doing so has also been a challenge for independent and industry experts. EPA should consider closely the technical recommendations provided by industry experts who have completed the due diligence that EPA has been unable to complete on their own or through the brief peer review period.

Not surprisingly, the panel looking at time horizons and discount rates seem to have the most disagreement. The assumption for time horizon and arbitrary application of a

discount rate have no direct correlation to the fuel lifecycle, yet have huge impacts on EPA's overall scoring of all Biofuels. Because these factors cannot be supported by sound physical science, but instead offer themselves to political manipulation, EPA should modify their methodology to eliminate the inclusion of these factors. It is wholly inappropriate to discount physical emission as one would discount economic considerations. If anything, emission will be more costly in the future, so EPA's discount rate should be applied in reverse to properly value the future carbon offset of Biofuels.

An alternative to inclusion of a time horizon would be to compare the annual sequestration of cropland with the lost sequestration of the alternative land use, such as a forest. EPA includes this comparison, which is independent of a time horizon. However, EPA also penalizes biofuels for carbon emissions of clearing mature forests. This is double counting, because mature forest reach equilibrium in carbon sequestration and do not sequester as much carbon as a young, growing forest. By comparing only the lost sequestration potential, a more robust method of accounting results. This method eliminates the uncertainty of choosing a time horizon. It eliminates the uncertainty of whether forests are cleared by burning or by harvesting the wood products. EPA lacks any forward-looking data to show the method of future land conversion. Applied fairly, economic models would surely predict land owners would harvest valuable timer rather than waste it by burning. Harvesting forest products could generate credits for sequestering carbon. However, that credit would be due to the forestry industry, not livestock or row crop agriculture, which EPA claims drives land conversion. This also raises the question, if timber harvest causes removal of forest material, does burning of the remaining biomass get attributed to the timber industry or the land use that follows the initial land conversion activity? The alternative accounting suggested here, removes this difficult to answer questions from the equation. Failing evolution of the approach suggested here, EPA should consider a very long time horizon. Since, Biofuels derive their biggest carbon benefit by displacing petroleum, and it took millions of years to sequester that carbon into fossil fuels, even a 100-year time horizon severely undervalues the benefits of renewable fuel.

Unfortunately, EPA provided no big picture review of their modeling. We know that there are imperfections in all of the models and the data, but what impact do all of those problems and assumptions have on the final number? There is no discussion about the basic concept that more demand means more land, for example. One thing the review did highlight is the fact that the experts have very different opinions about how the various parts of this should be done. It adds weight, in my view, that more time and a lot more data is required before anyone could possibly think that they have the right number.

4) <u>Limitations of Emissions Imposed by the RFS-2 Rule by Congress</u>

The original legislation put forth by the US Congress contains no evidence that it ever intended to address *international land use issues* associated with biofuel production, yet the US EPA seems to significantly bend this rule. International land use and any emissions that result from its use for energy, environmental, and economic purposes

is highly complex and has not been adequately researched or debated to make such broad and far-reaching conclusions that have significant effects to the US biofuels industry.

5) Omission of N_2O in the Emissions Life-Cycle

It appears that the US EPA failed to even follow the IPCC (International Panel on Climate Change) protocols with respect to N_2O emissions, did not appear to realize soybeans actually 'fix, nitrogen in the soil, and appeared to impose a penalty on soybeans for N_2O emissions.

In addition, as a larger issue, the US EPA does not appear to have a real grasp of US agriculture concerning crops, yields, cropping rotations, and the physical and chemical characteristics of soil all of which affect production, yield and eventual effect on air, soil, and water quality all of which have a "roll through" effect on land use emissions.

6) Omission of a Co-product Credit with respect to the Production of Glycerin

The US EPA also does not give credit to the biodiesel production co-product of glycerin through their use of the FASOM model. The GREET model does give credit and that credit has always been accepted by the scientific community.

7) Other Concerns

US EPA relies upon several models to gain insight on agricultural, economic, and trade issues. The interaction of these models has definitely not been thoroughly vetted to see even if the data sources upon which they rely even match up. In addition, it also appears that the general scientific community really has no idea how these models really work or what the actual calculations are that influence the outcomes. This is a major flaw with respect to the US EPA's overall approach and significantly damages their credibility and approach.

Conclusions

In conclusion, there are significant problems with the approach, data, review, and just general handling of US EPA's rulemaking concerning greenhouse gas emissions associated with biofuels production. These problems are so vast and far-reaching that the engineering, economic, environmental, and policy recommendations put forth by the US EPA can not be taken seriously and need to be opened up to the general public for a more transparent review and definitely need much more scientific analysis in the areas of agriculture/agronomy, economics, environment, sociological, and trade performed before this is allowed to proceed.

As a start, given the global warming potential of N_2O and its dramatic effect on greenhouse gas life-cycle emissions as well as the obvious omission of a co-product credit for glycerin, these two areas need to be re-analyzed immediately by a number of credible engineering and science-based professionals and researchers. These two areas, if adequately corrected, could have a tremendous effect on the life-cycle greenhouse gas outcome and will have a large and direct effect on the US EPA's approach to estimating international land use emissions.

Submitted September 17, 2009
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