



Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

Date: July 17th, 2008

Re: Comments by the Union of Concerned Scientists (UCS) on CARB's ongoing work on Land Use Change presented June 2008

To: Anil Prabhu, Dean Simeroth and John Courtis

From: Jeremy Martin and Patricia Monahan

Thank you for the opportunity to comment on CARB's ongoing life cycle analysis work and specifically on the computation of emissions from land use change for the LCFS. We would like to commend the excellent work you are doing to get the most accurate estimates of all significant sources of emissions. Building the low carbon fuel standard regulations on the best available science is fundamental to its ultimate success.

We were impressed with the presentation by Professor Thomas Hertel on the augmentation of the capabilities of the GTAP model to answer relevant questions pertaining to biofuels. The open, reproducible and peer reviewed process through which GTAP land use change predictions are developed makes GTAP a strong foundation upon which to build estimates of global warming pollution from indirect land use change.

We note that the use of GTAP for the precise purpose of assessment of the carbon intensity of biofuels is new, and the state of the art can be expected to improve over time. Professor Hertel mentioned, for example, the need for more data on crop yields after land conversion, particularly for bioenergy crops not currently in large-scale production. Thus, it is to be expected that new data and iterative development of more detailed models, along with the peer review and verification process, will lead to increasing precision and confidence in the results. For this reason, we urge that a process of periodic revision of the AFCI values be put in place, to ensure the regulations are built upon the best most up to date science.

We were encouraged by the fact that the GTAP estimates of how much land is converted per thousand gallons of ethanol mandate were quite robust across scenarios, and are broadly consistent with the previously published results of Searchinger et al. The fact that these results are consistent across research groups, even with very different economic models, demonstrates that price induced changes in land use are significant and will not go away with a slightly different set of assumptions. This confirms the importance of including indirect land use changes in the AFCI calculations.



Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

The translation of land conversion area to carbon emissions is another critical part of the calculation, and the preliminary results from pages 28 through 33 of the CARB presentation provide a good preview of what we can expect in the future. Different assumptions about emissions factors or types of land converted significantly alter the quantitative indirect emissions per unit fuel. However, the results from GTAP and FAPRI consistently show that indirect emissions are one of the largest components of the lifecycle emissions, and that omitting them will produce qualitatively incorrect results for the relative emissions of corn ethanol versus gasoline.

We also note the two letters submitted to Mary Nichols on the question of indirect land use on June 24th and 26th. We strongly support the argument of the June 26th letter by Delucchi et al. We agree that there is no basis to exclude indirect land use considerations from life cycle accounting for the Low Carbon Fuel Standard, in effect assigning a zero value to this substantial source of emissions. While there is obviously uncertainty in the precise magnitude of future emissions due to indirect land use change, there is no such lack of certainty that indirect land conversion has a major impact on emissions. New studies find that using corn or soybeans to make fuel is accelerating changes in land use that increase global warming emissions, and as a result, the AFCI for these fuels is higher than gasoline. Ignoring this effect will send the wrong signal to the marketplace. We support CARB's work with GTAP to estimate as accurately and objectively as possible the global warming pollution associated with indirect changes in land use.

In summary, we applaud the good work CARB is doing in this difficult but crucially important area and look forward to commenting further when more results are available.