



01-27-09

## Report boosts life-cycle benefits from corn-based ethanol

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There's fresh ammunition in the on-going battle over the economic and environmental benefits – or harm – from replacing petroleum with corn-based ethanol.

“Improvements in Energy Efficiency and Greenhouse Gas Emissions of Corn-Ethanol” is a 17-page report from University of Nebraska-Lincoln Prof. Ken Cassman and his colleagues. Firing back at ethanol's critics, the report published in the *Journal of Industrial Ecology* concludes that widely divergent calculations for ethanol are caused by critics basing their reports on what the industry was like a few years ago – not on today's far more efficient ethanol plants and current farming practices.

According to the report, life-cycle analysis shows greatly improved performance for greenhouse gas (GHG) emissions and energy efficiencies on the basis of updated values for crop management and yields, biorefinery operation, and coproduct utilization:

- “Direct effect GHG emissions were estimated to be equivalent to a 48% to 59% reduction compared to gasoline, a twofold to threefold greater reduction than reported in previous studies. Ethanol-to-petroleum output/input ratios ranged from 10:1 to 13:1 but could be increased to 19:1 if farmers adopted high-yield progressive crop and soil management practices.”
- “An advanced closed-loop biorefinery with anaerobic digestion reduced GHG emissions by 67% and increased the net energy ratio to 2.2, from 1.5 to 1.8 for the most common systems. Such improved technologies have the potential to move corn-ethanol closer to the hypothetical performance of cellulosic biofuels. Likewise, the larger GHG reductions estimated in this study allow a greater buffer for inclusion of indirect-effect land-use change emissions while still meeting regulatory GHG reduction targets. These results suggest that corn-ethanol systems have substantially greater potential to mitigate GHG emissions and reduce dependence on imported petroleum for transportation fuels than reported previously.”

Count on the critics firing back with their own updated analysis. But they will need to sharpen their pencils this time because, the report says, recent critical studies “rely on estimates of energy efficiencies in older ethanol plants that were built before the recent investment boom in new ethanol biorefineries that initiated production on or after January 2005. These recently built facilities now represent about 60% of total ethanol production and will account for 75% by the end of 2009.”

Critics still can cite negative indirect effects of land-use changes, such as when increased use of cropland for biofuels triggers conversion of forests or other land to cropland. The “Improvements” report does not cover indirect land-use changes.

For the full report, click on:

[http://www.ethanolrfa.org/objects/documents/2109/2009\\_jie\\_improvements\\_in\\_corn\\_ethanol-liska\\_et\\_al.pdf](http://www.ethanolrfa.org/objects/documents/2109/2009_jie_improvements_in_corn_ethanol-liska_et_al.pdf)

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