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Special Topics : Biofuels : Roel Hammerschlag

AUTHOR COMMENTARIES - From Special Topics
Biofuels - August 2008


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Roel Hammerschlag
From the Special Topic of **Biofuels**

This month, ScienceWatch.com talks with Roel Hammerschlag about his paper, "Ethanol's energy return on investment: A survey of the literature 1990-present," (Environ. Sci. Technol. 40[6]: 1744-50, 15 March 2006), which is a core paper in the Biofuels Special Topic Research Front Map of "Ethanol Biofuels."

Hammerschlag is a Staff Scientist at the US branch of the Stockholm Environment Institute, where he works in the Climate and Energy Program. In 2007, he received a fellowship from the University of Washington Program on Climate Change and was inducted into the National Honor Society for Public Affairs and Administration.

In this interview, ScienceWatch.com Roel Hammerschlag discusses the paper and how it has influenced biofuels legislation.

SW: Would you please describe the major points of your paper and why it is garnering citation attention?

The paper is a literature review of energy-return-on-investment (EROI) analyses for corn and cellulosic ethanol. The paper has received citation attention because it succeeds in normalizing and comparing multiple research teams' results, and because it is transparent and easy to read. At the time it was written and published, there was a great deal of dispute in the popular press about the EROI of corn ethanol. The paper cut neatly through that dispute because it showed that all but one of the research teams' results led to uniform conclusions, namely that:

1. corn ethanol marginally reduces fossil fuel use; and
2. cellulosic ethanol can displace far more nonrenewable energy than corn ethanol.

SW: How did you become involved in this research, and were there any particular successes or obstacles that stand out?

I have been assisting various organizations with greenhouse gas accounting and greenhouse gas policy for a long time. Two environmental advocates—NRDC and Climate Solutions—wanted to get to the bottom of the debate happening in the press; I had worked with both of these organizations before so they turned to me to do the

review. They were in a rush and I was due to be married in two weeks and go on a honeymoon, so I did the whole project in just two weeks. It was a real rush to capitalize on my experience to deliver such a thorough piece of work in such a short amount of time. Of course there was still plenty of work after my honeymoon, adapting my original report to become a manuscript for *Environmental Science & Technology*!

SW: Where do you see your research and the broader field leading in the future?

Right now we are seeing a similar rush of press activity around bioenergy, but this time regarding competition with food crops rather than the more esoteric issue of EROI. Though the current effect of bioenergy demand on food prices is probably overstated, the potential for EU and US bioenergy policies to affect global food access and prices is very real. I am moving into global trade modeling and agricultural sector modeling, to learn more about how social, environmental, and economic variables can affect the balance of energy and food crops globally, especially keeping in mind the livelihoods of populations in developing nations. So I am happy to see the press focusing on this issue, since it deserves attention.

SW: What are the implications of your work for this field?

I think the biggest value of the ES&T article was to underscore the trifling climate benefits of corn ethanol and highlight the large, positive step cellulosic ethanol could offer in contrast. When I first researched the article just three years ago, most policymakers had never heard the word "cellulosic." Now that word is encoded in federal legislation (the Energy Independence and Security Act of 2007). I hope that I might have played some small role in that new awareness. ■

"Though the current effect of bioenergy demand on food prices is probably overstated, the potential for EU and US bioenergy policies to affect global food access and prices is very real."

Roel Hammerschlag
Stockholm Environment Institute
Seattle, WA, USA

Roel Hammerschlag's most-cited paper with 20 cites to date:

Hammerschlag R, "Ethanol's energy return on investment: A survey of the literature 1990-present," *Environ. Sci. Technol.* 40(6): 1744-50, 15 March 2006. Source: *Essential Science Indicators* from Thomson Reuters.

Keywords: literature review, energy-return-on-investment, corn ethanol, cellulosic ethanol, greenhouse gas accounting, greenhouse gas policy, environmental advocates.



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