

Transition to a Bioeconomy: Global Trade and Policy Issues

A conference March 30-31, 2009 Washington, D.C.

Executive Summary

Global trade and policy issues likely to occur as the world transitions to a global bioeconomy were examined March 30-31, 2009, in Washington, D.C., at the conference: *Transition to a Bioeconomy: Global Trade and Policy Issues*.

A collaboration of the Farm Foundation, USDA's Office of Energy Policy and New Uses, and USDA's Economic Research Service, the conference featured policy makers, energy industry representatives and academics addressing global energy markets, energy policies and their impacts on food systems and poverty, and the interactions of energy policies, food systems and global trade. Industry leaders provided perspectives on the future of energy, trade, and public policies.

The initial session of the conference featured four presentations addressing various aspects of the global energy market. Michael Schaal of the Energy Information Administration (EIA) of the U.S. Department of Energy led off the conference, addressing the "2009 Global Energy Outlook". Focusing on liquid fuels and using EIA's 2009 energy outlook, Schaal concluded that world-wide marketed energy consumption is projected to grow by 50% between 2005 and 2030. For those countries that are not part of the Organization for Economic Cooperation & Development (OECD) growth is projected to increase by 85%. This growth will keep world oil prices relatively high through 2030. With sustained high oil prices, renewables will be the world's fastest-growing energy source (2.1% per year) followed closely by coal (2.0% per year). With this projected increased growth in energy, energy-related carbon dioxide emissions are projected to rise to 34.3 billion metric tons in 2015 and 42.3 billion metric tons in 2030 from 28.1 billion metric tons in 2005.



Wallace Tyner of Purdue University discussed potential 2009 policy options for the United States and European Union. Tyner discussed several alternative grain ethanol policy options:

- a 45¢ per gallon ethanol subsidy,
- no ethanol subsidy,
- a variable ethanol subsidy that would begin when oil reached \$70 per barrel and increase \$0.0175 for each dollar crude falls below \$70 per barrel, plus a variable subsidy beginning at \$90 per barrel, and
- a renewable fuel standard of 15 billion gallons for corn.

Tyner also included analysis of cellulosic fuel policy options, including the current policy of \$1.01 per gallon, a technology neutral subsidy based on energy content, and a subsidy that varies with oil price and energy content. Tyner stated that all the renewable fuel policy options will be on the table in 2009. Those examining the options may express increased interest in variable incentives that cost less and do not have as many adverse consequences. His analysis found the cellulose biofuels will not come on without strong incentives or a credible mandate. Finally, Tyner cautioned that climate change policies could change the entire landscape for renewable energy policy.

Thomas Alfstad, Brookhaven National Laboratory, presented a paper “A Technical Global Biofuels Analysis”. Alfstad’s analysis found that there is significant potential for rapid expansion of biofuel production over the coming two decades, with global biofuel production in various scenarios range from 34 billion gallons to 64 billion gallons in 2020 and 47 to 106 billion gallons in 2030. According to Alfstad, existing biofuel policies send very strong signals to producers and will test the industry’s ability to expand as supply is pushed to the inelastic part of the supply curve.

The final paper of the initial session was presented by John Reilly, Center for Energy and Environmental Policy Research at Massachusetts Institute of Technology. Speaking on the topic, “An Outlook for Energy Alternatives,” Reilly stated that it “appeared unlikely that conventional fuel prices will return to high enough levels in the next couple of decades to give alternatives a good chance” without climate policies that assure carbon dioxide (CO₂) emissions are priced.

The second session of the conference focused on the impacts energy policies might have on food systems. Tom Hertel of Purdue University examined global energy policies impacts on those in poverty. Hertel stressed that evaluating the impacts of poverty as a result of biofuel production is complex, and will change depending on the country of interest. His examination of 16 countries indicated some “systematic patterns”. As expected, biofuels increase food prices and agricultural returns. The earnings effect from increased agricultural returns will make a systematic contribution toward reducing poverty. Increasing poverty results from the spending effect. Hertel concluded that poverty is reduced for agricultural self employed and diversified households, while it increases for wage labor, transfer and non agricultural self-employed. In generally, Hertel reported that poverty impacts are mixed. Preliminary results indicate that biofuels have a negative impact in Latin America and a positive impact in Asia.

Al Mussell of the University of Guelph discussed global meat trading patterns and the impacts ethanol might have on meat exporting countries. Using Ontario as a case study, Mussell examined the impacts of the Canadian ethanol mandate—and its subsequent effects of increased ethanol development—on Canada’s livestock industry. Ethanol development strengthened the Ontario corn basis and weakened demand for feeder animals, thus releasing animals to be fed elsewhere. This reduced the North American feeder price, meat supply and exports from Ontario which increased the Ontario and world meat price. Mussell’s study found that ethanol development increased the relative

in-country price of feed grains and provided a policy-driven advantage to meat exporters located in countries not pursuing ethanol manufacturing.

The third session of the conference focused on global impacts of biofuels policies. Laurent Javaudin of the Delegation of the European Commission to the United States, discussed the drivers behind current and future European biofuels policies. Sustainability is a cornerstone of European Union (EU) policy. Elements of the policy include growing greenhouse gas (GHG)-saving thresholds; not allowing the conversion of wetlands, continuously forested areas or peat land; avoiding losses of highly biodiverse grassland; not using raw material from primary forest, protected areas, and highly biodiverse grassland; and ensuring environmental & social standards.

University of California Economist David Zilberman discussed the role of the Organization of Petroleum Exporting Countries (OPEC) and the impact OPEC member-countries have on biofuels. Many of the biofuel market studies assume a competitive market but ignore OPEC, Zilberman noted. Using a competitive energy market model and a Cartel model, Zilberman analyzed the impacts of increased quantities of biofuel on OPEC nations. He found that the impacts of biofuel on the oil sector depend on assumptions regarding market structure. Consumer and producer welfare impacts are very sensitive to the cost structure assumed. It is likely that a mature ethanol market will reduce the wedge between the domestic OPEC price and the international prices, which would make OPEC worse off and oil importers better off compared to the current situation.

Seth Meyer, Food and Agricultural Policy Research Institute, examined the trade effects of U.S. biofuel policies. His analysis covered two policy scenarios—all current supporting ethanol policies are extended and current policies expired. Under the current policies extended scenario, corn and soybean prices are about 60¢ per bushel and \$1 per bushel higher, respectively, than if the ethanol policy did not exist. There are several variables that impact the magnitude of these findings including petroleum price, corn yield, and corn exports. Meyer found that if petroleum price were to increase to \$110 per barrel, the impact on corn price would be cut in half.

The final session of the conference provided industry perspectives on the future of energy and public policies. Panel members were Joel Velasco, Brazilian Sugarcane Industry Association; Manning Feraci of the National Biodiesel Board; Paul Willems of BP Energy Biosciences Institute; Mark Willers of Minwind Energy; and Mark Dietzen, INEOS Bio. Velasco identified three building blocks necessary for energy security from biofuels—fuel production, infrastructure and competitive prices. Velasco said biofuels must be prepared to live in a low oil price climate. He also discussed how sugarcane can meet the ethanol mandate while significantly reducing the fuel carbon footprint.

Feraci discussed issues facing the U.S. biodiesel industry. The industry has 176 plants at a name plate capacity of 2.61 billion gallons. However, only 690 million gallons were produced in 2008 or less than 25% of capacity. Major challenges include volatile crop commodity prices, constricted markets, lack of capital, and uncertain federal policy,

especially with regard to indirect land use rulings. Willems discussed the work of the BP Energy Biosciences Institute, and focused on current and potential policy variables including land use, climate change, trade, vehicle technology, energy efficiency, technology incentives, and the greening of conventional hydrocarbons. He discussed various factors that may prove to be barriers to the development of biofuels, including the economics of ethanol versus gasoline; economics of ethanol under different carbon prices; timing of cellulosic fuel commercialization and production; the cost of cellulosic fuels versus conventional ethanol; the ability of market to grow engineering capacity, production capacity, infrastructure, logistics, and distribution; trade flow restrictions such as tariffs and quotas; and the implications resulting from the debate on food versus fuel.

Willers noted that using wind to produce energy is capital intensive and energy efficient. With much of the production of turbines taking place in Europe, currency exchange rates and interest rates are critical variables when evaluating potential wind power projects. Interest is the largest cost in establishing a wind farm, costing \$2,200 to \$2,400 per MW as the capital is borrowed at long-term rates of 8% to 9%. Another major obstacle to developing wind is the scarcity of transformers. It can take 14 months to 16 months to obtain a transformer. Dietzen discussed his company's focus on using agricultural and commercial waste streams as feedstocks to produce ethanol. With a vision of using a low-cost carbon waste stream, INEOS plans to deliver cost-effective and sustainable products, including ethanol, methanol, propanol, and butanol. Using a high-heat gasifier, bioreactor and distiller, INEOS is constructing a pilot plant in Florida to convert vegetable waste and construction waste.

Summarizing the conference was Charles Stenholm of Olsson Frank Weeda Terman Bode Matz PC, and a former Congressman who chaired the House Agriculture Committee. Stenholm noted that currently there are no clear winners with regard to conversion technologies—rather a patchwork of technologies exists. For the time being, oil will be the fuel of choice, he said, though in the future it will be necessary to wean the nation of oil. Future energy policy decisions need to reflect what the future might hold as new technologies evolve, and those policies should be kept simple, Stenholm added.

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The Planning Committee for the *Global Policy and Trade Issues* conference Committee included David Zilberman of the University of California, Berkeley, Suchada Langley of USDA's Economic Research Service, Wallace Tyner of Purdue University, and Steve Halbrook and Michael Popp of the University of Arkansas.

This conference was the fourth in the *Transition to a Bioeconomy* series, which was designed to improve understanding of the evolving bioeconomy, discuss potential positive and negative impacts this new economy might have, and identify potential barriers to development and research needs. These conferences and the products produced from them will provide government, industry, academic and community leaders with objective information and analysis they can use to make more informed decisions related to the bioeconomy in the next decade.

Presentations and/or proceedings are available for all *Transition to a Bioeconomy* conferences:

- Integration of Agricultural and Energy Systems (February 2008)
- Risk, Infrastructure and Industry Evolution (June 2008)
- Environmental and Rural Development Issues (October 2008)
- Global Trade and Policy Issues (March 2009)

The final conference in the *Transition to a Bioeconomy* series was June 30-July 1, 2009 in Little Rock, Ark., and focused on tools for Extension educators.

The *Transition to a Bioeconomy* conference series was a collaboration of Farm Foundation, USDA Office of Energy Policy and New Uses, USDA Economic Research Service, USDA Rural Development, USDA Natural Resources Conservation Service and the U.S. Forest Service.

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