



Biofuels and Food

This paper is an adaptation of a lecture that Thomas C. Dorr, under secretary for Rural Development at the United States Department of Agriculture (USDA), gave at the AACC International Annual Meeting in San Antonio on October 9.

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The explosive development of renewable energy is a worldwide story and has broad implications for national security, energy security, and the environment. It also has differential effects for many industries, regions, and sectors of the economy. From the perspective of agriculture and rural development, renewable energy is a historic opportunity for wealth creation in rural communities, both in the United States and around the world. It is important that the discussion of biofuels and food be viewed in this broad context.

Interest in renewable energy is growing around the world. Not surprisingly, national approaches have varied widely. Europe, for example, is incurring a significant production penalty—for fuel as well as food—due to its reluctance to accept genetically modified organisms (GMOs). At the same time, European governments have been willing to impose much higher gasoline taxes on motorists and inflict higher utility costs on consumers than would likely be tolerated in the United States. These are important policy differences.

In the United States, the renewables revolution is being driven by at least four factors: 1) geopolitical concern over import dependency, 2) rising environmental concerns, 3) rising global prices for oil and

- Renewable energy is largely rural energy. Biomass, including but not limited to biofuels, depends on farm and forest feedstocks.
- USDA Rural Development has therefore emerged as a leading funding agency for the commercialization of emerging renewable energy technologies. For rural America, this is an enormous opportunity for wealth creation.
- The increases in food prices we are experiencing today are driven largely by surging demand from Eastern Europe, China, India, and other countries that are experiencing rapid economic growth, rising living standards, and a rapid upgrading of dietary standards.
- Net farm income—already at a record high—is projected to rise significantly, while direct government payments are expected to decline. Grain prices are expected to experience a short, near-term spike, then decline as new production comes online.

natural gas, and 4) aggressive policy leadership from President Bush and Congress. The benchmarks tell a remarkable story:

- The United States has quadrupled ethanol production since 2000. Last December, President Bush signed into law a 36 billion gallon Renewable Fuels Standard (RFS) that will further increase production by a factor of five above current levels by 2022.
- Installed wind capacity has increased nearly sevenfold in this decade. The United States has led the world in new capacity in 2005, 2006, and 2007 and is on track to be the world leader in total capacity by the end of next year.
- U.S. biodiesel production was 2 million gallons in 2000. By 2010, according to USDA's baseline projections, the United States anticipates producing 680 million gallons.

- Globally, photovoltaic installations have risen more than 25% annually over the last decade and 35% annually in the past five years, while in the United States domestic shipments of photovoltaic units have increased by a factor of ten since 2000.
- Last but certainly not least, cellulosic ethanol is moving from the labs into production. The technology still needs to be demonstrated on a commercial scale, but the first generation of plants are being built right now.

While the purpose of this paper is to discuss biofuels, not wind and solar, I offer these benchmarks as an indication that the renewables revolution is both real and broad-based. It is not going away. Biofuels are not an outlier or an anomaly. Present developments reflect a fundamental shift in resource economics across the energy sector

and around the world. High oil prices and maturing technologies change everything. Markets rule.

If you are wondering what this has to do with USDA Rural Development, the answer is simple. Renewable energy is largely rural energy. Biomass, including but not limited to biofuels, depends on farm and forest feedstocks. Wind, because of its siting requirements, is also a largely rural resource. At the federal level, USDA Rural Development has therefore emerged as a leading funding agency for the commercialization of emerging renewable energy technologies.

For rural America, this is an enormous opportunity—probably the greatest new opportunity for wealth creation in rural America in our lifetimes. I am proud of the work our staff and our partners in the private sector have done to turn this potential into a reality. The opportunity is equally great abroad. It has been both exciting and inspiring to work with our colleagues in Canada, Europe, China, Brazil, and elsewhere around the world to begin the long, but necessary, process of diversifying away from oil.

This transition raises many issues. One of the most visible of these is the current “food vs. fuel” debate. Since commodities markets are global, it is necessary to frame this discussion in global terms. It is a fundamental error to think of the food vs. fuel question as primarily a battle among energy producers, protein producers, and cereal producers in the United States. The issue is much bigger.

From an international perspective, I would suggest that the single most important thing that has happened in the world in our generation was the fall of the Berlin Wall and, coincident with the collapse of the Soviet Union, the decisive turn of India, China, and most of the third world to market economies. Since 1989, between two and three billion people have joined the world market system. This is the greatest explosion of economic freedom in world history. The world is a vastly richer and significantly more competitive place than it was 20 or even 10 years ago. This is reflected, among other things, in commodity prices—not just cereal grains, but oil and natural gas, steel, and concrete as well.

It is important therefore to recognize that the increases in food prices we are experiencing today are driven largely by surging demand from Eastern Europe, China, India, and other countries that are

experiencing rapid economic growth, rising living standards, and a rapid upgrading of dietary standards. These are good things. They are good for hundreds of millions of people, many of whom used to be among the poorest of the world’s poor. They are certainly good things for farmers—both American farmers and subsistence farmers in the third world who are finding new markets and new prosperity.

Yes, American consumers will see an impact at the grocery store—but that is a consequence not only of biofuels, but even more of hundreds of millions of people who today are living and eating better.

The feedback loops are complex. However, if one looks at USDA’s long-term projections, we anticipate that we can accommodate the current biofuels buildout while still serving our food, feed, and export markets. Even with the anticipated expansion of biofuels, U.S. agriculture will continue to be a net exporter. In fact, the USDA long-term forecast projects the value of U.S. agricultural exports to rise by more than 23% (\$77 billion to \$95 billion) through 2016.

At the same time, net farm income—already at a record high—is projected to rise significantly. Direct government payments are expected to decline, which is good news for the taxpayers. Biofuels will drive corn and soybean prices with a ripple effect across other crops. In response, production will be ramped up both here and abroad. Grain prices are expected to experience a short, near-term spike, then decline as new production comes online.

Bottom line, markets are dynamic. They will adjust. But when all is said and done, the net impact as currently projected by USDA is that retail food prices—already a bargain by any historical standard—will increase less over the next ten years than will the general inflation rate. Food will remain a bargain in the United States.

The impact on rural America, however, is already profound. Just consider this: Current ethanol production displaces as much oil as we import from Iraq, or almost half of what we import from Venezuela. We are going to double production again in the next two years as we build out to a 12–15 billion gallon ethanol industry, based on corn.

The next step is cellulosic ethanol, which is necessary to meet the recently enacted 36 billion gallon RFS. This target implies a new market for biofuels half the size of today’s net farm income. A little further down the road, if we can displace a billion barrels of oil imports with biofuels, the new market will exceed net farm income.

The long-term potential is enormous. Based just on existing feedstocks, a recent USDA-U.S. Department of Energy study, the Billion Ton Study, estimated that cellulosic ethanol has the potential to supply 30% of our current transportation fuel needs by 2030. New feedstocks and potential increases in energy yields are likely to increase that potential significantly.

In addition, renewable energy resources are inherently distributed. Production and ownership are widely dispersed. Much of this is made possible by distributed computing, which allows networked production systems to achieve economies of scale and to be efficiently integrated into legacy systems. The result will be a new industrial infrastructure in rural areas with great potential for jobs and economic growth in rural communities. This is a goal well worth pursuing.

In conclusion, biofuels today are an extraordinary opportunity. There will be adjustments along the way, but in the final analysis, I share Julian Simon’s confidence in what he called “the ultimate resource,” human ingenuity. Markets work; high-priced oil is shifting the resource base. It’s our job to plan accordingly and to help smooth the transition.



Thomas C. Dorr is the under secretary for Rural Development at the USDA. Rural Development administers more than 40 programs that provide loans, grants, and loan guarantees for rural infrastructure, housing, community facilities, business, and energy development. Rural Development’s current portfolio exceeds \$99 billion. He also serves as the chairman of the USDA Energy Council. He has served as a member of the board of directors of the 7th District Federal Reserve Bank of Chicago, the Iowa Board of Regents, and as a member and officer of the Iowa and National Corn Growers Associations. Dorr was the president of a family farming and agribusiness company for 30 years.