



Date: March 4, 2010

To: Secretary of Agriculture Tom Vilsack, United States Department of Agriculture
USDA Rural Development Under Secretary Dallas Tonsager
1400 Independence Avenue SW
Suite #200A
Washington, DC 20250-0101

RE: Expediting USDA 9003 Biorefinery Program, 9007 REAP Energy Grant-Loan Guarantee Program, and ARRA Business and Industry Loan Program Funds for 2010 Shovel-Ready Sustainable Technologies Projects

Background

President Obama and the current Administration have set some very specific goals for renewable energy growth and development, which have included a reduction in the United States' dependency on imported fossil fuels, increasing renewable bioenergy production, reducing greenhouse gas emissions, and creating quality jobs.

The United States has 5 percent of the world's population but consumes about 25 percent of the world's total energy, and, as a consequence, energy security is a matter of great concern and a significant strategic problem. More than 60 percent of our transportation fuels are imported. If nothing is done, U.S. import dependency is expected to increase to 75 percent by 2030 (Energy Information Administration, U.S. Department of Energy). Clearly the United States must diversify its energy sources.

Biofuels play a key role in providing the United States with sustainable energy options and energizing our country's economy with new industries and jobs, and can help to revitalize U.S. rural communities.

- On May 5, 2009, President Obama issued a Presidential Directive to aggressively accelerate the investment in and production of biofuels, and directed Secretary Vilsack to expedite and increase production and investment in biofuel development efforts by: Refinancing existing investments in renewable fuels to preserve jobs in ethanol and biodiesel plants, renewable electricity generation plants, and other supporting industries; and
- Making renewable energy financing opportunities from the Food, Conservation and Energy Act of 2008 available within 30 days. These opportunities include:

- Loan guarantees for the development, construction, and retrofitting of commercial scale biorefineries and grants to help pay for the development and construction costs of demonstration-scale biorefineries;
- Expedited funding to encourage biorefineries to replace the use of fossil fuels in plant operations by installing new biomass energy systems or producing new energy from renewable biomass;
- Expedited funding to biofuels producers to encourage production of next-generation biofuels from biomass and other non-corn feedstocks;
- Expansion of Renewable Energy Systems and Energy Efficiency Improvements Program, which has been renamed the Rural Energy for America Program, to include hydroelectric source technologies, energy audits, and higher loan guarantee limits; and
- Guidance and support for collection, harvest, storage, and transportation assistance for eligible materials for use in biomass conversion facilities.

As of this date, expedited funding for these loan guarantee programs has not been implemented.

The most recent, major energy policy legislation in the United States is the Energy Independence and Security Act of 2007. This includes aggressive renewable fuels consumption targets for the United States. The renewable fuels standard mandated by the "Energy Act" requires the United States to utilize in its fuel supply 36 billion gallons of biofuels by 2022. This amounts to between 20 and 25 percent of our transportation fuel. The goals established by the 2007 Energy Act are also predicated on the rapid development and commercialization of cellulosic ethanol and other advanced biofuels.

I heartily support this goal, and have worked with several major cellulosic ethanol and algae production companies to develop projects and apply and receive federal funding, including Coskata and Sapphire Energy (our company assisted in completing the recently approved 9003 Guaranteed Loan application). I have attached a recent document from the Biotechnology Industry Organization entitled "Can Cellulosic Biofuel Producers meet the Renewable Volume Obligations?". The Appendix to this document lists the current projects that are slated to begin over the next several years, and the nameplate capacity for each.

Opportunity

The Food, Conservation, and Energy Act of 2008 (the 2008 Farm Bill) gave USDA important new tools to expand and promote biofuels and bioenergy production. The 2008 Farm Bill is the second farm bill to explicitly include an energy title (Title IX), which expanded USDA Rural Development's renewable energy portfolio. Rural Development has several programs in place that have operated efficiently and effectively to fund renewable energy projects in past years. 2010 appropriations include:

- 9003 Biorefinery Guaranteed Loan Program - \$245 million mandatory funding with an estimated 1:10 multiplier which equates to a \$2.5 billion loan guarantee

authority for commercial scale refineries, plus \$150 million appropriated with an estimated 1:10 multiplier which equates to a \$1.5 billion loan guarantee authority for demonstration and pilot plant facilities.

- 9007 Rural Energy for America Program - \$60 million mandatory funding in 2010, with \$45 million discretionary funding also available.
- Business and Industry Loan Guarantee Program – \$1.3 billion in loan guarantees for a wide variety of projects in rural areas.
- ARRA B& I Guaranteed Loan Program - \$1.7 billion under Division I, Title A, of the Recovery Act to provide additional funds to lenders to improve, develop, or finance business, industry, and employment and improve the economic and environmental climate in rural communities. These funds are available and are required to be allocated by September 30, 2010.

A total of \$7.1 billion is available for fiscal year 2010 under these current programs. The only two programs that are currently open for applications at this time are two Business and Industry Loan Guarantee programs, with a total allocation of \$3 billion. Of these funds, only \$743 million have been allocated to date.

There is currently \$6.357 billion in funding, allocated through the Farm Bill and appropriated by Congress, which is available to fund sustainable technologies projects and support the Federal initiatives by September 30, 2010. However, the inability of USDA to clear and publish the funding notices in the Federal register for these programs and set reasonable deadlines for submission of the applications fails to give applicants adequate time to prepare, apply, and submit applications for these programs. In addition, USDA is failing to allow these monies to be distributed to develop projects that will create economic development and jobs in rural areas, and contribute to our country's national security and renewable fuels goals. I have attached a document listing current projects that would be eligible for funding if these programs were open, in addition to the advanced biofuels projects previously cited.

Current Financing Constraints

The following issues and solutions were presented at the recent Renewable Energy World North America Conference during the "Renewable Energy Financing" session on February 24, 2010 in Austin, Texas. The presentation focused on the two key problems below, and recommended solutions to these problems.

Problem #1: Lack of underwriting expertise with community banks and a perceived long-term risk associated with renewable energy loans.

Financing for renewable energy has its roots in production agriculture and with farmer cooperatives that are served by the Farm Credit System. However, now more non-farmers

are involved in the development of renewable energy and these entrepreneurs do not have the access to the Farm Credit Agency, and instead have to rely on community bankers and hedge funds for financing. For the most part, Main Street lenders have yet to develop an understand of the underwriting necessary for financing ethanol, cellulosic ethanol, advanced biofuels, biodiesel, wood pellets and other sources of renewable energy. Little in the way of education has taken place to teach community bankers how best to determine the financial viability of a renewable energy project. Even with government guarantees provided by USDA and also by DOE, banks still perceive the risk to be too great and thus pass on these projects that in many cases could proved an important economic shot-in-the arm for these rural communities. Some would argue that community banks “redline” these projects, much like banks were accused of doing with inner-city businesses and housing in the late 1980’s and early 1990’s. To overcome that obstacle during that period, Congress and banking regulators established Community Reinvestment Act (CRA) requirements that mandated that lenders serve this segment of their communities.

Banks argue that these loans have to stay on their books for years and therefore this subjects lenders to market risks that many small banks are simply unable to absorb. Unlike mortgage loans and rural land loans, a “secondary market” that allows banks to sell these loans off to an entity like Fannie Mae or Farmer Mac does not exist. Banks argue that without a further way to mitigate risk, their participation in this new domestic industry will be limited. Creating a secondary market would “liquefy” these funds thereby freeing up bank capital that can be invested further in other renewable energy projects or other commercial and residential ventures.

Problem #2: Lack of participation from community banks due to undue restrictions from the USDA programs and regulatory agencies.

All of the USDA programs listed above require bank participation to qualify for the loan guarantees. This participation is demonstrated by providing a conditional letter of commitment as well as the ability of the lender(s) to fund the guaranteed and the unguaranteed portions of the loan.

Traditionally, community banks in rural communities provided the banking relationships and for participation in these USDA programs. However, current economic and regulatory conditions and a steep yield curve have hindered the ability and desire of community banks to participate in these USDA programs. Our company is currently working with over 120 banks, including national, regional, and smaller community banks. The overall message that we hear every day in opposition to working with USDA from our clients and providing funding includes:

1. The USDA guarantees cannot be used to guarantee the loan during the construction period, which is the period with the highest risk to the lenders. (9003 and ARRA B&I might be exceptions)
2. Construction loans (over and above the equity contribution) that are provided by owners of the project cannot be paid back through use of the USDA guaranteed loan funds at time of closing, further restricting an already disappearing market for

- construction loan funding.
3. Current banking regulations have established tighter standards concerning the borrowing base for any one lender.
 4. Distrust among lenders has wiped out the syndication networks necessary to fund larger transactions.
 5. Bank regulators are changing the guidelines for servicing areas, and severely restricting banks from funding projects in an extended region further than 120 miles.
 6. Concern and experience with the time and expense of collecting the USDA guarantee has deterred many banks from continuing to participate in the USDA loan guarantee programs.

Over the last 16 years, Westar Trade Resources has assisted clients in the development, management and funding of many bioenergy projects, resulting in over \$147 million in grant and loan funding for our clients, with over \$100 million received in 2009.

In October 2009 our firm was retained by a client in Houston, Texas to assist in obtaining a \$5 million USDA Business and Industry Guaranteed Loan in Kershaw County, South Carolina for a facility to produce a renewable #6 heating oil from waste greases. The company has over \$8 million in assets, is backed by two venture capital companies with combined assets of \$72 million, and has established markets for the feedstock and the fuel. The plant operates with a 40% gross profit margin when in full production, and the construction on the facility was completed the last week in January. We contacted over 78 banks in Texas, North Carolina, South Carolina, and other nearby states, many whom had been listed as soliciting and servicing USDA guaranteed loans in the past. From this list we received one offer of a term sheet for \$3 million from Celtic Bank in Utah, an industrial bank that specializes in USDA loans. The other 77 banks declined to participate, due to the reasons listed above.

The venture capital groups had issued a construction loan for \$2.1 million for the project. Due to the current restrictions within the USDA guidelines, that loan was unable to be serviced within the current guidelines and the owners of the project were forced to convert this loan into equity due to lack of a take-out financing arrangement as per their loan guidelines.

This is just one example of the current banking climate that we and our clients face every day. The inability to locate and obtain financing, even with a USDA loan guarantee, is hindering many strong, well-capitalized projects from getting built. I have attached a list of current projects that could be financed if funding could be obtained.

Recommendations

The USDA has a program in place that is mandated by Congress and has been used to successfully fund renewable energy projects in the past, however, we need the leadership from this current Administration to assist in developing new guidelines and procedures so that companies with sustainable projects can move forward and begin construction.

I am calling on the current Administration to work within the existing framework of the regulatory and banking networks and provide preferential treatment for these renewable energy loans to include:

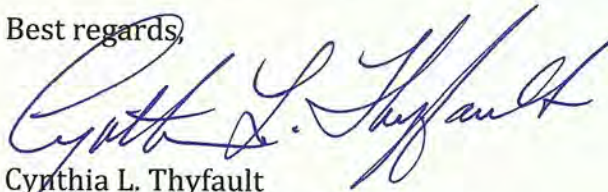
1. Develop a "preferred status" of renewable energy loans within the Farm Credit Banking system and the Federal Land Bank system.
2. Hold meetings with bank regulatory agencies and the Farm Credit and Federal Land Bank system to develop a guideline document with five year or longer terms that will provide a framework and structure that will allow banks to feel secure in providing and servicing these loans.
3. Within the next 30 days, open the Notice of Funds Availability for the 9007 and the 9003 programs, and keep the application window open year-round to develop a flow of applications through the system that can be systematically processed and approved.
4. Allowing the 9007 grant monies to be used at the beginning stages of the projects, to assist in engineering and development costs, instead of utilizing the funds as the "last money in."
5. Enact new servicing and foreclosure guidelines that will allow banks to recover their portion of the guaranteed funds quicker and easier.
6. Remove the distance requirements for servicing the loans.
7. Develop a syndication structure throughout the two banking systems that will allow for the greatest amount of loans to be funded rapidly, and for larger projects to be funded using these programs.
8. Redraft the "owner payback" provision to allow UCC-1 recorded construction loans to be paid back to owners of the projects.
9. Allow for all construction loans to be covered by the USDA loan guarantees.
10. Extend the borrowing base for lenders to process these loans and provide for larger loans in their current portfolio.
11. Hire additional personnel from the banking sector to assist in processing these loans.
12. Work with Congress and federal and state financial institution regulators to expand the Community Reinvestment Act (CRA) requirements imposed on depository institutions to include loans made to entrepreneurs and companies commercializing renewable energy projects in their communities. This will entice and encourage lenders to learn how to make loans to these companies and produce much needed debt financing for these projects.
13. Work with Congress and federal and state financial institution regulators to create a secondary market for renewable energy loans that would mitigate some of the risk associated with long term financing necessary for renewable energy projects such as advanced biofuels, ethanol, cellulosic ethanol, biodiesel and other ventures. This secondary market could be pursued in one of three ways:
 - Expand the charter of Farmer Mac or the Federal Home Loan Bank System to allow these government-sponsored enterprises (GSE's) to purchase renewable energy loans from lenders.

- Congress could authorize the establishment of the “Renewable Energy Government Loan Corporation (*Reggie Mac*) that had a mission to purchase renewable energy loans from lenders. As with other GSE’s, these loans would be pooled and securitized and sold to investors who are interested in buying AAA-rated paper from other (GSE’s) such as Fannie Mae and Freddie Mac. Pooling different types of renewable energy projects further helps mitigate risk and helps stabilize funding for future developments; or
- Congress should authorize a study to be carried out jointly by USDA and DOE to examine the feasibility of an in-house secondary market entity (like Ginnie Mae) that would be charged with purchasing renewable energy loans from lenders.

Conclusion

The USDA Loan Guarantee programs currently in place and enacted by Congress play a vital role in National security by providing the financing necessary to fund renewable energy projects and bring about the necessary reduction in the United States’ dependency on imported fossil fuels, increasing renewable bioenergy production, reducing greenhouse gas emissions, and creating quality jobs. It is extremely urgent that Secretary Vilsack and Under Secretary Tonsager work quickly with other agencies to provide the necessary framework and guidelines that will allow for funding to reopen for renewable energy companies across the United States. This is a problem that must be solved swiftly and serve the national interest of all involved. We need to work within the existing banking and regulatory framework to provide swift, long-lasting solutions to these current problems. I welcome an opportunity to meet with you to discuss these issues and solutions in further detail, and work with the current Administration to provide solutions to these problems.

Best regards,



Cynthia L. Thyfault
President, Westar Trade Resources

**Potential USDA Grant and Loan Guarantee Projects
Westar Trade Resources Clients**

Project Name	Project Location	Project Summary	Total Project Cost	Project Debt to be Financed	Annual Revenue	Annual EBITA	Total Jobs Created	Units/Year Produced (Gallons, Btu's, tons, etc.)
G & A Technologies	Hereford, TX	Acquisition and completion of a Biorefinery that uses gasification and combustion of manure as source of heat.	\$98 million	\$38 million	\$220 million	\$35 million	67	Fuel Ethanol 105,000 gallon WDGS 850,000 ton
Waste to Energy	Houston, TX	100,000 MT/year Pellet production plant, 220 MWH of Renewable power through the use of traditional and 4th generation production methods (boiler system, gasification, BTL & GTL technologies).	\$500 million	\$400 million	\$300 million	\$172 million	1,000	220 MWH
Large Dairy Operation #1	Midwest, U.S.	Digestion of cow manure to capture methane for the creation of vehicle fuel (CNG) and to power a CHP unit for the generation of renewable electricity and heat. Project will also refine the liquid digestate into ammonium sulfate. A future project phase may include cellulosic conversion of digested compost into commercial grade ethanol. The clean waste water will be recycled and used for irrigation.	\$45 million	\$32 million	\$15 million	\$9 million	8	320,000 mmBTU's CNG 160,000 mmBTU's thermal value 4.8 MW power 40,000 ammonium sulfate
Large Dairy Operation #2	Southwest, U.S.	Same as Large Dairy Operation #1	\$36 million	\$25 million	\$12 million	\$7 million	7	3.8 MW power 32,000 ammonium sulfate
Large Dairy Operation #3	Western, U.S.	Same as Large Dairy Operation #1	\$35 million	\$24 million	\$11 million	\$7 million	7	350,000 mmBTU's thermal value
Food Processing #1	Southwest, U.S.	Cheese whey permeate digested to capture methane for the creation of vehicle fuel (CNG) and/or for powering CHP units to generate renewable electricity, heat and steam. Project waste stream is clean water.	\$52 million	\$36 million	\$17 million	\$10 million	10	350,000 mmBTU's thermal value

Food Processing #2	Western, U.S.	Vegetable processing waste and other substrates digested to capture methane for the refining of vehicle fuel (CNG) and/or for powering CHP units. Project will efficiently reuse and recycle water.	\$37 million	\$26 million	\$12 million	\$7 million	7	220,000 mmBTU's thermal value 7.2 MW power 20 MW
Wind Power	Corpus Christi, Texas	20MW Wind project	\$35 million	\$25 million	confidential	confidential		
Algal Oil Processing	South Texas	100 acre project	\$100 million	\$75 million	confidential	confidential	50	confidential
Algal Oil Processing	New Mexico	100 acre project	\$100 million	\$75 million	confidential	confidential	50	confidential
Algal Oil Processing	Arizona	100 acre project	\$100 million	\$75 million	confidential	confidential	50	confidential
Power Block #1	Riverside, CA	96 MW Geothermal project	\$197 million	\$144 million	\$37 million	\$17 million	10	96 MW
Renewable Natural Gas Facility	Erath and Deaf Smith Counties, TX	Manure to biogas	\$60 million	\$15 million	confidential	confidential	12	635,000 MMBTU
Renewable Natural Gas Facility	Fresno and Kings Counties, CA	Manure to biogas - 3 facilities	\$115 million	\$40 million	confidential	confidential	18	2 million MMBTUS
Total:			\$1.51 billion	\$1.105 billion	\$624 million	\$264 million	1296	



March 4, 2010

Secretary of Agriculture Tom Vilsack, United States Department of Agriculture
USDA Rural Development Under Secretary Dallas Tonsager

Re: Difficulty In Securing Financing Through The Renewable Energy Programs

Dear Secretary Vilsack and Under Secretary Tonsager:

Tri Global Energy, LLC ("Tri Global") is a leading renewable energy developer working to develop, construct, and operate numerous projects that contribute to a sustainable future using clean energy technologies while strengthening this country's national security and utility infrastructure. These technologies include wind, solar and geexchange systems. Specifically, Tri Global is currently developing seven (7) different large scale wind farms in Texas and New Mexico ranging from a 20KW wind farm to a wind farm in excess of 1600MW. In addition, Tri Global has an additional twenty (20) wind projects currently in its queue.

Tri Global partners with communities to develop, design, finance, construct, own and operate renewable energy projects. We utilize a patent pending business model, "The Wind Force Plan™", which enables Communities & Landowners to participate in the ownership and profits of their own utility scale wind farm. One of our primary goals is to promote, educate and guide communities and clients through the stages of developing renewable energy projects and to advance the quality of life for generations to come. Our vision includes the revitalization of rural communities by promoting investment in domestic renewable energy resources and giving a voice to local communities.

Wind energy plays a key role in (i) providing the United States with sustainable renewable energy options, (ii) energizing our country's economy with new industries and jobs, (iii) the revitalization of U.S. rural communities, and (iv) strengthening the nation's utility infrastructure.

It is in that vein, this letter is written. On a cursory level, it appears there are numerous government programs designed and implemented to assist companies such as Tri Global. Such programs include, among others, the Energy Independence and Security Act of 2007, Business and Industry Loan Guarantee Program, 9007 REAP Energy Grant-Loan Guarantee Program,

ARRA Business and Industry Loan Program Funds for 2010 Shovel-Ready Sustainable Technologies Projects, and other USDA and Rural Development Programs (collectively, the "Programs"). However, attempts to secure funding for our renewable energy projects have been extremely difficult and unsuccessful and do not appear to be getting better unless measurable changes are made.

Lenders currently do not comprehend the underwriting processes for renewable energy projects with respect to the financial viability of such projects. Banks perceive the risks associated with these types of renewable energy projects to be too great despite both the government guarantees provided by the USDA and the Department of Energy and the Community Reinvestment Act. In addition, there is currently no secondary market for these types of loans which, in turn, do not allow any sort of mitigation of risk on a banks behalf.

Many of the Programs require bank participation. However, the rural community banks that have traditionally catered to the local communities and that have participated in various USDA programs are extremely reluctant to provide the required relationship the Programs demand. The banks major concerns are (i) the inability to use USDA guarantees to guarantee a loan during the construction phase of a project, which is the period with the greatest risk, (ii) the inability to use USDA guaranteed loan funds to pay back a construction loan when closed, (iii) the geographical limitations, placed by bank regulators, on a bank's service area, and (iv) the constantly tightening standards regarding the borrowing base for any one bank.

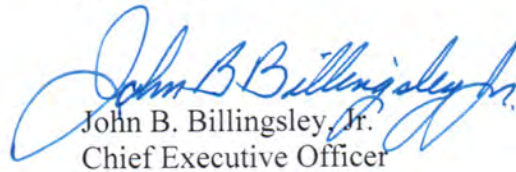
The Programs in place need to be redefined with new guidelines and procedures so that companies, like Tri Global, can move forward with its renewable energy projects. It has been advocated that preferential treatment for renewable energy loans be given in the following ways:

1. Create a "preferred status" of renewable energy loans within the Farm Credit Banking System and the Federal Land Bank System.
2. Work with bank regulators to develop a system with specific indentified terms in which will allow banks to feel secure in providing and servicing the renewable energy loans.
3. Immediately open the Notice of Funds Availability for the 9007 program and keep the application window open year-round to allow for a flow of applications that can be systematically processed and approved.
4. Enact new servicing and foreclosure guidelines to allow banks to recover their portion of the guaranteed funds quicker and easier.
5. Remove the geographical limitations for servicing the loans.
6. Develop a syndication structure throughout the banking system that will allow for the greatest amount of loans to be funded quicker, and for the larger projects to be funded using these programs.
7. Allow for all construction loans to be covered by the USDA loan guarantees.
8. Revise the "owner payback" provision to allow UCC-1 recorded construction loans to be paid back to owners of the projects.
9. Extend the borrowing base for lenders to process the loans and provide for larger loans in their current portfolios.

10. Work with Congress and federal and state financial institution regulators to expand the Community Reinvestment Act requirements imposed on depository institutions to include loans made to companies commercializing renewable energy projects in their communities.
11. Work with Congress and federal and state financial institution regulators to create a secondary market for renewable energy loans that would mitigate some of the risk associated with long term financing necessary for renewable energy projects such as wind, solar, and geexchange projects.

Tri Global fully supports the proposed solutions. The Programs currently in place are essential to serving the national interest of all involved from the local farmer leasing his land to the federal government reducing its greenhouse gas emission and creating sustained quality jobs. The current environment allows you to make the proposed changes quickly so that long-lasting solutions to the major barriers in developing the much needed renewable energy projects can be resolved. I welcome the opportunity to discuss the issues and proposed solutions and look forward to working with your administration.

Best Regards,



John B. Billingsley, Jr.
Chief Executive Officer



March 4, 2010

To: Secretary of Agriculture Tom Vilsack, United States Department of Agriculture
Under Secretary Dallas Tonsager, USDA Rural Development

Gentlemen:

United Power is a renewable project developer, owner, and operator. We are advancing a number of biomass to energy projects where we have integrated processes to convert agricultural, dairy, and agri-industrial wastes into valuable energy products including biogas and its derivatives, commercial-grade fertilizers, and cellulosic biofuels.

Cindy Thyfault, President of Westar Trade Resources is familiar with the fundamentals of our project pipeline. We have appreciated Cindy's professional insights into financing and structuring options for our renewable assets. I believe Cindy may have shared with you certain of our projects under development.

As you know, in the United States the biomass to energy sector is not well developed (we have only reached around 15% of our potential, according to the USDA & DOE). We continue to be hampered by (a) piecemeal legislation where a comprehensive energy policy is warranted, (b) conservative equity markets, (c) project finance (debt) sources that have been hibernating for the past two years, and (d) government support programs which are in need of improvement.

It has come to our attention that Westar Trade Resources has proposed changes to various government programs, including the Section 9007 REAP program, the Section 9003 BioRefinery Guaranteed Loan Program, and the Business and Industry Loan Guarantee Program. I have reviewed Westar's recommendations, and I agree they are necessary to bring capital into this important sector.

In addition, we find that development capital (funds to perform early engineering, permitting, etc.) is very hard to secure in this nascent industry. Consequently, allowing the Section 9007 REAP grant funds to be released during the project development phase will go a long way to bringing a larger number of projects to a financeable stage. We also agree that the \$500,000 grant limit should be raised to at least \$750,000.

Thank you for considering our position on these matters. Please do not hesitate to contact me at 253-431-9250 (mobile) for any questions you might have.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Divers".

Robert E. Divers
Founder and CEO
United Power Company, LLC



Can Cellulosic Biofuel Producers Meet the Renewable Volume Obligations?

Biotechnology Industry Organization

September 2009

Executive Summary

Commercial development of cellulosic biofuels has been slowed by the current economic recession, limiting the industry's ability to produce the volumes called for in the Renewable Fuel Standard in the next few years. The RFS contains mechanisms to rebalance the required volumes and support continuing progress toward the goals set for later years. Continued federal commitment is necessary to support the significant progress already made by private companies.

Introduction

The intention of the Renewable Fuel Standard (RFS) is to increase production and use of biofuels. It calls for production and use of 100 million gallons of cellulosic biofuels in 2010, 250 million gallons in 2011, 500 million gallons in 2012, and 1 billion gallons in 2013. At these levels, cellulosic biofuels would be expected to remain less than 1 percent of all transportation fuels used annually in the United States until 2014. However, by 2022 cellulosic biofuels are projected to make up more than 10 percent of the transportation fuel pool.

Passage of the Energy Independence and Security Act of 2007 (EISA, PL 110–140) has prompted substantial investment in advanced biofuel production by major energy companies, which in turn has funded increased research, development and deployment efforts by small companies. This progress is the foundation for the emergence of an industry capable of meeting the RFS volume requirements by 2022. Still, many advanced biofuel projects currently face delays due to unfavorable economic conditions and frozen investment markets; undeveloped feedstock supply chains; protracted site selection and permitting processes; and lagging implementation of federal support programs and regulatory rules.

As of September 2009, a reasonable estimate for current cellulosic biofuels production capacity is 3.91 million gallons per year, though actual production may be lower (90 percent is estimated). An additional 28.35 million gallons of capacity are estimated to come online by the end of 2010, meaning that a proportion (25 percent is estimated) will be available to meet the standard during the year. An additional 117 million gallons is estimated to come online during 2011, again with a fraction available to meet the standard during that year.

As the economy emerges from the recession, the commercial development of cellulosic biofuel should be expected to regain momentum and meet targeted production levels by 2022. Full implementation of the RFS regulatory rules and federal support programs is needed by the industry to ensure continued progress.

In passing EISA in 2007, Congress, federal agencies, industry, and the environmental community recognized that while the technology for cellulosic biofuel production is ready for commercial development, other factors (such as favorable economic conditions, private investment, and feedstock market development, guided by sustained federal commitment to the commercialization of this technology) are also necessary to establish a functioning nationwide market for cellulosic biofuels. EISA

therefore includes several provisions to ensure that obligated parties can comply with the law while still purchasing and selling cellulosic biofuels that are priced competitively with petroleum and other renewable fuels.

How the RFS Works

The Renewable Fuel Standard obligates all U.S. fuel importers and retailers (*obligated parties*) to include a percentage of renewable fuels in all motor vehicle, nonroad, locomotive and marine fuels sold in the United States. The Environmental Protection Agency (EPA) is responsible for enforcing the RFS along with other fuel regulations pertaining to fuel content, regarding oxygenates and octane enhancers, and emissions under the Clean Air Act (USC 42(85)).

The RFS program was significantly expanded in 2007 in response to concerns about energy security and global warming. The Energy Policy Act of 2005 (PL 109–58), which first established the RFS, required production and use of at least 7.5 billion gallons of renewable fuels by 2012, which was to include at least 250 million gallons of cellulosic biofuels beginning in 2013. EISA broadened the RFS, setting separate standards for both conventional and advanced biofuels, with specific volumes for cellulosic biofuels and biomass-based diesel as subcategories of advanced biofuels.

EISA established an aggressive standard for cellulosic biofuels based on two factors. The law included substantial federal support for research, development, demonstration and commercialization of technology and feedstocks for cellulosic biofuel production. Also, following initial passage of the RFS in 2005, the United States had experienced rapid growth and a high plant-construction rate for conventional corn ethanol, stimulated by demand for an oxygenate to replace MTBE and high-priced petroleum.

Because obligated parties are equally responsible for complying with the RFS, the EPA each year will translate the standard into a percentage of projected transportation fuel use, which is termed a *Renewable Volume Obligation (RVO)*. For EISA, EPA has proposed calculating separate RVOs for each of the conventional, advanced, cellulosic and biomass-based diesel standards. Projected fuel use is based on the Annual Energy Outlook published by the Energy Information Administration each October, adjusted to account for exemptions for small refiners and Alaska, which is not governed by the RFS.

To track compliance, EPA has established *Renewable Identification Numbers (RIN)*. Producers are assigned one RIN for each gallon of renewable fuel. The RIN is transferred with the sale of the gallon of fuel. Obligated parties then retire the RINs annually when they report their sales of fuels to the EPA.

How Cellulosic Biofuel Waiver and Credits Work

EISA empowers EPA to adjust or *wave* the cellulosic biofuel RVO, resetting it to coincide with projected actual cellulosic production levels. By Nov. 30 of each year, the EPA Administrator must evaluate the production capacity of the cellulosic biofuel industry for the following year and adjust the cellulosic biofuel standard to match. If the cellulosic biofuel standard is waived, EPA may – but is not required to – also reduce the annual advanced biofuel and the overall renewable fuel standards. If EPA lowered the advanced biofuel standard and the overall RFS by a lesser amount than the cellulosic biofuel waiver, it

would in effect allow other advanced biofuels to take advantage of the shortfall in cellulosic biofuels. A waiver would have no bearing on the standards for subsequent years.

In the event of a waiver, the EPA can also sell *cellulosic biofuel credits* (which EPA proposes to call *allowances*) up to the lowered production level of cellulosic biofuel. These allowances, in effect, would ensure that all obligated parties can meet the cellulosic biofuel standard at a competitive price. Because cellulosic biofuels will represent such a small percentage of transportation fuel, it is likely that their availability will be limited by geography and by existing off-take agreements, which might be with private university or state vehicle fleets. While some obligated parties may be able to sell cellulosic biofuels in excess of their RVO, others may not be able to buy, transport and sell them at a competitive price. Buying allowances would be one alternative to buying excess RINs from other obligated parties.

The allowance provision sets an upper limit to the value of excess RINs held by other obligated parties. It also effectively sets \$3.00 per gallon, adjusted for inflation, as the price point where cellulosic biofuels must be competitive with gasoline. The allowances can be priced annually at the higher figure of \$0.25 or the difference between \$3.00 and the current average national price of a gallon of fuel. An obligated party then has an additional option for meeting the RVO, which is to sell another fuel that is at least \$0.25 per gallon more costly than gasoline.

EPA has identified several ways in which allowances could distort the market for biofuels and proposed various options for limiting the risks. Obligated parties may have too much flexibility in meeting the RVO for cellulosic biofuels and advanced, since they can opt for allowances. And because the allowances set a price point for cellulosic biofuels, producers may be at a competitive disadvantage versus other biofuel producers.

Expected Capacity of the Cellulosic Biofuel Sector

In May, EPA released a combined proposed rule for the RFS and the various standards for 2010, proposing that none of the 100 million gallon cellulosic biofuel standard be waived in 2010. Surveying the industry in April 2009, they believed there were enough cellulosic ethanol and diesel plants planned or under construction to meet the standard in 2010.

The definition of cellulosic biofuel is two-fold – it must be made from renewable cellulose, hemicellulose, or lignin and it must reduce greenhouse gas emissions relative to a 2005 petroleum gasoline baseline by 60 percent, as determined by the EPA. To date, EPA has completed and released life cycle analyses showing that switchgrass and corn stover ethanol produced through biochemical conversion and fermentation can meet the 60 percent threshold by a very wide margin – in both cases reducing emissions by more than 100 percent compared to the baseline, in effect removing carbon from the atmosphere. Even if a land use change penalty of the same magnitude as that calculated for corn- and soy-based biofuels is applied to cellulosic feedstocks, cellulosic biofuels would still meet the 60 percent threshold.

EPA expects that wheat straw, rice straw, sugarcane bagasse, forest slash and thinning, algae and yard waste, as well as miscanthus and planted trees would produce similar results to switchgrass or corn stover, even though life cycle analyses have not been conducted. The agency also believes that

thermochemical transformation of these same feedstocks, even with the higher process energy requirements, would still meet the 60 percent threshold.

Following EISA, there has been substantial investment in research, development and deployment of cellulosic biofuels. The U.S. Department of Energy (DOE) and the U.S. Department of Agriculture (USDA) have begun implementing funding for small- and commercial-scale demonstration projects as well as continued applied research, such as the establishment of bioenergy research centers. Major energy companies have established partnerships with universities, national labs and small companies to advance research and commercial projects. A small sampling of these projects includes:

- In July 2008, Royal Dutch Shell plc and Iogen Energy Corporation announced an extended commercial alliance to accelerate development and deployment of cellulosic ethanol. Shell significantly increased its investment and increased its shareholding to 50 percent in Iogen Energy Corporation.
- In November 2008, U.S. Sugar Corp and Coskata entered into an agreement to explore constructing a 100-million-gallon cellulosic ethanol facility in Clewiston, Fla.
- In February 2009, BP and Verenum established a 50-50 joint venture to build commercial-scale biofuel plants in the United States, beginning with a 36 million gallon plant in Highlands County, Fla.
- In March 2009 Royal Dutch Shell plc and Codexis, Inc. announced an expanded agreement to enhance the efficiency of biocatalysts used in the Iogen cellulosic ethanol production process. Shell increased its equity stake in Codexis.
- In July 2009, Exxon announced an investment of \$600 million in producing biofuels from algae through a partnership with Synthetic Genomics.
- In September 2009, Mascoma Corp entered a two-year feedstock agreement with Chevron Technology Ventures. Chevron will provide lignocellulosic feedstock to Mascoma, which will then convert them to cellulosic fuel and supply Chevron with lignin from the process.

Further, there have been some early attempts to make cellulosic ethanol commercially available to consumers. In April 2009, AE Biofuels announced an agreement to supply Pearson Fuels with cellulosic ethanol and other biofuels for distribution through renewable fuels filling stations throughout California. In June 2009, Iogen and Shell implemented a one-month demonstration project to sell regular gas containing 10 percent cellulosic ethanol (CE10) at a Shell station in Ottawa. It is unlikely that these projects would have advanced without the impetus of EISA.

A new September 2009 survey by the Biotechnology Industry Organization (BIO) indicates that the combination of unfavorable economic conditions and frozen investment markets; undeveloped feedstock supply chains; protracted site selection and permitting processes; and lagging implementation of federal support programs and regulatory rules has reduced the volume of cellulosic biofuels likely to be produced and available as transportation fuel during 2010 to less than 12 million gallons. This estimate uses a conservative assumption that online plants run at 90 percent of capacity and that plants coming online that year will produce 25 percent of capacity.

Conclusion

The Energy Independence and Security Act of 2007 has been very successful in signaling large energy companies and small research and development companies to make significant investments in the cellulosic biofuel sector. The technology for cellulosic biofuel is ready for commercialization and companies have produced successes at each stage of research and development. The industry as a whole, however, has not developed at the pace targeted in the aggressive volume requirements of the Renewable Fuel Standard, primarily because commercial development has been slowed by the current recession.

The RFS contains well-thought out mechanisms to adjust to the current pace of development of cellulosic biofuels without hindering future development. The Environmental Protection Agency, which is currently finalizing regulatory rules to implement the RFS, is required to rebalance the standards on a year-by-year basis to adjust to the actual production level.

Full implementation of the support mechanisms in EISA can help the industry emerge from the current economic crisis and regain momentum to meet the future volume requirements. Continued lagging implementation of these programs threatens to send a conflicting signal to companies that have invested in commercialization of cellulosic biofuels.

Appendix: Current and Projected Production

BIO has tracked cellulosic ethanol projects since 2007 and made the results public through the Biofuels and Climate Change blog: <http://biofuelsandclimate.wordpress.com/about/>. Proposed projects have been added to and removed from the list on a regular basis as information about their status has been updated. Inclusion in the list requires that the project demonstrate a funding and/or feedstock procurement agreement in place; many of the funding agreements are in the form of state or federal support for the project.

Significant projects have been completed in Canada, which could supply the United States with cellulosic biofuels. Iogen's facility in Ottawa will produce an estimated 200,000 gallons of cellulosic biofuel in 2009 and beyond. Enerkem's facility in Westbury, Quebec, has a capacity of 1.3 million gallons of cellulosic biofuel.

A. Operating Biorefineries

As of September 2009, there are seven biorefineries in the United States and one in Canada currently operating and producing cellulosic biofuels. Their nameplate capacity is listed below, although actual production volume may be lower. Because some are state-funded projects, they have an agreement with a state agency to use the produced fuel for specific fleets.

Name	Location	Capacity (million gallons/year):	Year Operation Began
AE Biofuels	Butte, Mont.	0.15	2008
Coskata	Madison, Pa.	0.04	2009
Gulf Coast Energy	Livingston, Ala.	0.4	2009
Iogen	Ottawa, Ont.	0.2	2004
KL Energy Corp.	Upton, Wyo.	1.5	2008
Mascoma	Rome, N.Y.	0.2	2009
POET	Scotland, S.D.	0.02	2009
Verenium	Jennings, La.	1.4	2009

B. Biorefineries Expected to Begin Production in 2010

Name	Location	Capacity (million gallons/year):	Expected Start Year
BlueFire Ethanol	Lancaster, Calif.	3.7	2010
DuPont Danisco Cellulosic Ethanol LLC	Vonore, Tenn.	0.25	2009
Enerkem	Westbury, QC	1.3	2009
Fiberight, LLC	Blairstown, Iowa	5.6	2010
Flambeau River Biofuels LLC	Park Falls, Wisc.	6	2010
Range Fuels	Soperton, Ga.	10	2010
ZeaChem	Boardman, Ore.	1.5	2010

C. Biorefineries Expected to Begin Production in 2011

Name	Location	Capacity (million gallons/year):	Expected Start Year
Abengoa Bioenergy	Hugoton, Kan.	11.4	2011
Alltech Ecofin LLC	Washington Co., Ky.	1	2011
ClearFuels Technology	Commerce City, Colo.	1.5	2011
Fulcrum BioEnergy/Sierra Biofuels	Reno, Nev.	10.5	2011
Gulf Coast Energy	Mossy Head, Fla.	25	2011
Ineos Bio	Vero Beach, Fla.	8	2011
Old Town Fuel & Fiber	Old Town, Maine	1.5	2011
POET	Emmetsburg, Iowa	25	2011
Powers Energy	Lake County, Ind.	32	2011
Sapphire Energy	San Diego, Calif.	1	2011
University of Florida	Gainesville, Fla.	0.13	2011

D. Biorefineries Expected to Begin Production After 2011

Name	Location	Capacity (million gallons/year):	Expected Start Year
Abengoa Bioenergy	York, Neb.	10	
Agresti Biofuels	Pike County, Ky.,	20	2012
American Energy Enterprises, Inc.	New Milford, Conn.	24	
BlueFire Mecca LLC	Palm Springs, Calif.	17	
Citrus Energy, LLC	Boca Raton, Fla.	4	
Clemson University Restoration Institute	Charleston, S.C.	10	
Coskata, Inc.	Southeast, U.S.	55	2012
DuPont Danisco Cellulosic Ethanol		15	2014
Enerkem, Inc.	Pontotoc, Miss.	20	2012
Enerkem, Inc.	Edmonton, AB	9.5	2012
Genera (DDCE, UTenn.)	Tenn.	25	2012
ICM Inc.	St. Joseph, Mo.	1.5	
logen	Prince Albert, Sask.	18	2012
KL Energy Corp.	Kremmling, Colo.	5	
Mascoma Corp.	Kinross, Mich.	40	2013
Pacific Ethanol	Boardman, Ore.	2.7	2012
Pan Gen Global Plc	Colusa, Calif.	12.5	
PureVision Technology	Fort Lupton, Colo.	2	
Raven Biofuels	Miss.	33	2013
SunOpta Bioprocess LLC/Central Minnesota Ethanol Co-op	Little Falls, Minn.	10	2013

Terrabon	Bryan, Texas	0.1	
U.S. Sugar	Clewiston, Fla.	100	2013
Vercipia (BP, Verenum)	Highland Co., Fla.	36	2012
West Biofuels	Yolo Co., Calif.	0.182	
Woodland Biofuels	Mississauga, Ont.		

E. Algae Biorefineries

Name	Location	Capacity (million gallons/year):	Expected Start Year
Algenol	Freeport, Texas	0.1	2011
Cape Cod Algae Biorefinery	Bourne, Mass.	1	
Live Fuels, Inc.	Brownsville, Texas		