Department of Agriculture, Trade and Consumer Protection
Division of Agricultural Development
Agricultural Development & Diversification Program (ADD)
Grant Project Final Report

Contract Number: 24080

Grant Project Title: Feasibility study for biomass aggregation, densification, and storage facility in Wisconsin

Amount of Funding Awarded: $32,500

Name of Principal Contact Person: Randy Clark

Organization: RCI Engineering LLC

Email Address: clark@rciengineering.com

WEB Address: www.rciengineering.com

Report Submitted on: 1 September 2010

Please use the following questions as a guide for writing your grant project final report. In your final report, please answer each question as it relates to your grant project.

1) What was the original intent of the grant?
   - What did you want to accomplish with the grant?
   - How was it expected to benefit Wisconsin Agriculture?
   - What makes this project work important or significant?
2) What steps did you take to reach your goal?
   - What worked?
   - What challenges did you face?
   - What would you do differently?
3) What were you able to accomplish?
   - What are the results from this project?
   - Include any analysis of data collected or materials developed through project work.
4) What conclusions can you make based on project work the analysis of collected data?
5) What do you plan to do in the future as a result of this project?
6) What information or additional resources are needed to commercially develop this enterprise?
7) How should the agricultural industry use the results from your grant project?

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Project Objectives / Intent

The overall objective of this project was to demonstrate to the DOA the viability of utilizing corn stover and grasses as a feedstock for their heat and power plants, utilizing a regional aggregation and densification facility for the fuel preparation and storage. The specific objectives are:

- To develop a supply price curve for corn stover in Dane and surrounding counties. This will also include assessments of stover and grasses available; costs associated with in-field storage, harvest method, and transportation costs; and custom harvest effects on price.
- To evaluate the technical feasibility of a regional aggregation and densification facility for the processing of raw agriculture derived biomass into a useable heating fuel for the industrial, commercial, and residential markets.
- To evaluate the economic feasibility of the facility. This will be essential to determine the sale price of the biomass fuel.
- To complete a third-party review that will provide the framework for project planning and create the groundwork to attract the early investors required to move the project to the construction phase.

Actions Taken

To accomplish our first objective, surveys were conducted to obtain the needed input data for a preliminary supply curve. These surveys began with in-person meetings at the time of grant funding and targeted producers in south central Wisconsin. Three meetings were organized and held at County Extension Offices with success. We also met with County Extension Agents for Jefferson and Dane Counties to outline our intentions for the facility. Many of these people will influence the decisions of the producers as the time to sell biomass becomes a reality in their local area.

Another survey was conducted with direct mailings to approximately 500 producers. There were struggles initially to gain enough information to develop a mailing list of potential producers and then to have results returned. In the end, we located a source for a mailing list of all registered farms in a 30-mile radius to the proposed site location. In the future, we would likely work out the details of a mailing list for the survey before embarking on such a program.

The other three goals have been completed with an independent engineering firm to conduct a feasibility study. Frazier Barnes and Associates was selected as the agency to complete the feasibility study. The feasibility study verified many of the conclusions we had made in our own research.

For the evaluation of technical feasibility of the processes for the facility, we continued our work on aggregation and densification independently of this grant project. We have researched many commercial operations that are working with the following components of biomass feedstock logistics: raw feedstock storage on/off farm; material handling; artificial drying vs. in-field dry down; equipment and plant design for cubing, pelleting, and briquetting; and transportation for feedstock and finished fuel. Many critical gains were made, particularly in the area of efficient densification of corn stover and grasses, and material handling of the stover and grasses coming in to such a facility.

The evaluation of economic feasibility has been made utilizing results of the surveys and technical feasibility study to assess a fuel price that is required to ensure viability of the facility.

The final task is assembling the results and outcomes of the three tasks to have a comprehensive plan and roadmap for a viable, sustainable biomass fuel facility. We have the basic plans for a facility prepared, but are currently waiting on the State of Wisconsin for release of the RFP. Upon its completion we intend to hold three meetings(Dane, Dodge and Jefferson Counties) to present the results to the three main constituencies: state officials, farmers, and other stakeholders. This will give all stakeholders realistic expectations, and set the stage for the development of a biomass fuel facility.

Upon completion of a biomass aggregation and densification facility, there will be a secondary market for local producers for their corn stover and a source for spreading of ash from the biomass plant on their land to return nutrients to the soil. This will benefit Wisconsin Agriculture by routing dollars previously spent on coal from other states to local producers, railway companies, and other businesses supporting the facility. More government money spent on energy will stay local. This is significant as it is a means to prime the local economy without adding significant long term costs to existing means for energy under the requirements to convert Charter Street to a biomass / natural gas facility.

Results

All objectives were completed under this program. Surveys continue to return to us on a daily basis, but the results thus far are attached. The feasibility study by FBA is *considered confidential*. The study shows that our capital costs are reasonable, as well as our calculated cost per ton of processed stover. For more information regarding the feasibility study please contact RCI Engineering.

Conclusion

Through the feasibility study, we can conclude that there is a solid business model for the gathering, aggregation and densification of corn stover and grasses to supply the Charter Street facility in the near future. We have learned that there is an interest on the part of producers to supply this facility, although a fair amount of marketing and education will need to take place to adequately supply the facility. The meetings prepared initially aided in spreading the word on our intentions for the facility, and helped us to connect to the right people with regards to the County Extension Offices.

Future Plans

At this time, we are pursuing final plans for a regional biomass aggregation and densification facility, while waiting for the RFP from the State of Wisconsin. We intend to carry this concept through to completion in one fashion or other, depending on capital availability for the facility.

Resource Requirements of Future Plans

The funding requirements of the planned facility are approximately $20 million. We are currently working with different entities to determine the best path of financing. The RFP is critical for completion before securing financing at this time. The next steps are the RFP, making the cut to the final round, and then sourcing capital for the facility. It is our belief that a contract will need to be in place to gain the capital needed. We intend to pursue the program in this matter.

Other Applications of Knowledge Gained

The knowledge gained in this feasibility study may be beneficial to any other biomass handling facility in the future. The cost determinations for supply of material are most critical, as this is a key driver to the feasibility of the facility. Also, the basic business model is flexible to accommodate other materials gathered for processing. We believe that this study can be used by those pursuing a variety of facilities in the future.

Biomass Survey Results August 2010

Contact	Address	City	ST	Zip	Question #1 # Acres You Make Decision For?	Question #2 # Acres Corn for grain do you harvest per year	Question #3 How many Acres Stover do you have to sell harvested "standing"	Question #4 Skip to #5 If rather have Custom Harvester	Question #5 Sell price Harvested Stover $/ton dry matter	Question #6 Sell price /Acre As it lays in field- 1/2 stover harvested
		Waunakee	WI	53597	3500	1800	*	*	*	*
		Cottage Grove	WI	53527	1000	500	300	*	$25.00	$80.00
		Lodi	WI	*	230	138	138	*	*	$75.00
		*	*	*	321	59	*	*	*	*
		Watertown	WI	53094	600	200	200	*	*	*
		Fall River	WI	53932	350	140	80-100	*	$100.00	$80.00
		Stoughton	WI	53589	750	275	100	*	$65.00	$30.00
		Verona	WI	53593	300	100+	Varies	*	*	?
		Sun Prairie	WI	53590	850	400	300	*	*	$50.00
		Fall River	WI	*	1540	580	100	*	No Idea	No Idea
		Sun Prairie	WI	53590	150	50	None	*	*	$10.00
		Deerfield	WI	53531	800	None	None		Grass- $90	*
		Waunakee	WI	53597	1100	650	650	*	$60.00	*
		Columbus	WI	53925						