

FINAL REPORT (Revised) – EXECUTIVE SUMMARY



Project Number: Contract No. R-016-026,
**Renewable Energy Commodity Trading
Educational Program**

Recipient: Dr. William W Wilson, North Dakota State University
Award Amount:\$500,000
Total Project Costs: \$1 million

Goal of Project: This project proposes to develop a world class commodity trading room that will be used for education programs on risk and risk management in the renewable energy sector. The objective was to develop a world class renewable energy commodity trading educational program targeted to students, feedstock suppliers, and industry personnel. The goal was to improve risk management strategies and better trained employees in this sector. The impact of these would be reduced risk, and as a result, less volatile returns and more investment in the sector.

Significant Findings: The project had a number of tasks, including:

- 1) Data set development. Extensive data important to the ethanol industry were assembled and/or identified within the NDSU Commodity Trading Room.
- 2) Educational Programs. A series of annual seminars entitled **Ethanol Merchandising and Risk Management** were presented commencing from 2014. These were targeted to the midwestern ethanol manufacturing industry. These were well attended and surveys indicated satisfaction with the course and content. In latter years, more specialized programs were developed and presented.
- 3) Research Programs Research Papers Completed: These were previously summarized, and we currently have a number of academic papers and industry reports published and/or under review. Notably, these include papers on:
 - Hedging and risk management in ethanol
 - Logistics strategy, and risks in ethanol firm management
 - Development of a “Ethanol Margin Model.” This model was created for teaching and was introduced in the June 2018 seminar using current values of ethanol, DDGs, corn, and natural gas. The purpose of this model is to analyze risks and margins associated with different contracting strategies.
 - A research paper was prepared titled **Managing Risk in Ethanol Processing Using Formula Pricing Contracts**. This was accepted and presented at several academic meetings. This paper explored how inherent risks in this industry could be absorbed or transferred to supply chain partners. absorbed by the ethanol manufacturer.

- 4) Proposed Bioenergy Curriculum. A curriculum involving a specific course on Bioenergy Trading and Marketing was developed.



Retrospect: It was not practical to present these materials in a new NDSU stand-alone course offering (i.e., class for credit). The roadblocks include:

- It takes extensive committee review to approve a new course to be taught as an NDSU course. This includes reviews by curriculum committees at the Departmental level, College, and University, and then approved by the University Senate; and, finally approved by the SBHE
- It is likely comparable reviews would be necessary to be approved on the NDUS system
- There would be an additional cost for making the course offering; but, there is no way it would be approved for a 1-time offering. It would require continual commitment.
- Finally, while we have at least 2 faculty (Dr. Ripplinger and Dr. Bullock) who could teach this course, it would require either paying overload and/or creating a change in the position description, which have to approved throughout the NDUS system.

Each of the above are onerous and time consuming, and were not apparent when the details of the deliverables were specified.

In the future, if the means and interest were available to commit to teaching a separate stand-alone academic course, at least the materials would be available.

Next Steps: A proposal was provided to the Renewable Energy Program (Report #11). That would require external funding to NDSU. It would provide a course that would be available throughout most of the North Dakota University System, and address important managerial issues to the bioenergy business.

Benefits of the Project to ND: One of the important value-added processing industries in North Dakota is the ethanol manufacturing business. This industry is a preferred market for corn grown in the region providing a routine 12-month per year market for an industry with growing corn production. However, this sector has extreme risks due in part to the volatility in the corn market, as well as that in the output market including ethanol, DDGs' among others. Some of these are easily hedgeable but others are not. This risk is an important feature of this industry and effective mitigation of the risks are essential to survival. Research and the educational programs provided under this project has had the impact of improving firm's ability to manage these risks, and as a result improve the profitability and survivability.