

Contract No. R-039-049

“New Implementation of Stack Heat Recovery Technology to Increase Efficiency and Production at Existing Ethanol Production Facility”

Submitted by Hankinson Renewable Energy, LLC

Principal Investigator: Dodi Matti

PARTICIPANTS

Sponsor	Cost Share	
Hankinson Renewable Energy, LLC	\$2,742,569	
Subtotal Cash Cost Share	\$2,742,569	
North Dakota Industrial Commission	<u>\$500,000</u>	
Total Project Cost		\$3,242,569

Project Schedule – 8 months
Contract Date – May 24, 2019
Start Date – May 22, 2019

Project Deliverables		
Status Report	August 31, 2019	✓
Status Report	November 30, 2019	
Final Report	November 30, 2020	

OBJECTIVE/STATEMENT OF WORK:

HRE’s current ethanol production rate is steam-limited during the winter months inhibiting the plant’s ability to produce ethanol, thereby limiting overall production. This project will address this limitation through the installation of a Stack Heat Recovery (SHR) system. The SHR system is designed to capture excess heat energy released from the plant’s dryer exhaust stack and recycle the heat back into the production process. In addition, the system will collect water condensation from the dryer exhaust stack and use it for boiler make-up and process water. In effect, the system will improve efficiency by decreasing natural gas and make-up water needed, while increasing the production of ethanol and coproducts.

The project is expected to increase ethanol production by an estimated 10 million gallons per year. It will serve as a demonstration for other North Dakota ethanol plants interested in utilizing the technology. It will result in increased ethanol production, increased demand for corn, increased supply of coproducts, and additional revenue in the state.

HRE expects to see significant benefits, including:

- Reduction of water usage by 6.4% per gallon of ethanol.
- Reduction of natural gas usage by 8.2% per gallon of ethanol.
- Increase annual net income by \$4,478,000.

STATUS:

The contract has been executed.

September 2019

Status report has been received. The report states in part:

Process Engineering was completed by May 31, 2019. Procurement of major equipment and instrumentation commenced mid-May, and all equipment and material was on order by mid-June.

The contractor mobilized on-site June 3, 2019. The condensate tank and flash tank vessels have been fabricated and installed. The steam piping has been installed. The water piping has been installed from the vessels to the pump locations. The pumps were delivered to the site the week of August 26, 2019. The pumps will be set the week of September 3, 2019 and water piping will be completed to the pumps. The SHR fans were delivered on September 3, 2019.

Overall, the project is estimated to be 45% complete. The steam educator, the electrical motor controllers, and the heat exchangers are the remaining equipment to be delivered. The heat exchangers have the longest lead time and are expected to be delivered mid-October. The construction of the project is expected to be completed by November 30, 2019.

Equipment Testing & Trials as well as Process & Evaluation will commence once the construction is complete.

CUMULATIVE EXPENDITURES				
Project Expense	NDIC	REP Recipient	Other Sponsor	Total
Mechanical Installation & Equipment	\$836,487.70	\$836,487.71		\$1,672,975.41
Total	\$836,487.70	\$836,487.71		\$1,672,975.41

Updated 9/5/2019