

# North Dakota Renewable Energy Program Status Report

**Recipient:** c2renew

**Contract Number:** R-025-035

**Report for time period of:** November 12, 2018

## DESCRIPTION OF PROJECT

*Please provide a brief description of the project:*

The objective of the project is for a pilot scale operation to measure and validate expansion of c2renew corporations' production and development with existing collaborators; Bobcat Co., John Deere Co., Earth-Kind Inc. and Toshiba Corp., as well as new customers, Fargo 3D Printing, Intelligent Agricultural Solutions, Bogobrush, etc. The pilot facility will include a 75 mm twin screw extruder and ancillary processing equipment.

## PROJECT TASKS

*Please describe the progress on all project tasks achieved during the reporting period:*

### **Purchase of: Twin Screw Extruder, Polymer Dryer, Air Compressor, Dust Collector, and Chiller**

- We are currently installing equipment into our new space at 2222 7<sup>th</sup> Ave N in Fargo, ND. As part of the equipment install we had some electrical upgrades made to the space. A larger electrical panel was installed to provide 480 V service to our equipment. In addition to the panel a larger electrical transformer was installed by the utility provider, Xcel Energy.

In addition to the panel, conduit lines were run for new plugs as well as lines for equipment that needed to be hardwired. Modifications are currently being made to the building to accommodate the air handling and ventilation of equipment.

### **Throughput Rate – measure percent change from current production to production in pilot facility and how additional extruder lines impact the rate.**

- We have currently oversold the current capacity on our existing extruder line and are assessing whether to add a second shift of production once our large scale biomass dryer is at full operational capacity. This would allow us to evaluate the economics of how multiple shifts impact the throughput of our equipment.

This is currently still the state we are in as we have added additional work during our move.

### **Unit Economics – analyze the difference in the cost of goods, personnel cost and shipping with an expansion of production (i.e. IAS and Toshiba)**

- We continue to analyze the unit economics have started to get better margins as we continue to purchase larger amounts of biomass as well as working out larger biomass supplier agreements.

### **Cost of Production – measure the change in scrap rate, equipment up-time and extruder profile change over.**

- Can't be measured at this time.

**Production Scheduling – refine production schedule and define a manufacturing ERP system for scaled growth.**

- We continue to try different scheduling systems; Slack, Airtable, Asana, old-fashioned Excel spreadsheets and we are finding a combination of an online portal and Excel is a good combination. We have met with a local software firm that is developing an ERP system for service businesses.

**DELIVERABLES**

*Please describe the progress on project deliverables, as stated in your contract, achieved during the reporting period:*

**\*Production Growth: Expand production to 6 million pounds per year.  
(\*noted added by c2renew...this is 6 million pounds of finished product per year)**

<b>FEEDSTOCK</b>	<b>POUNDS PROCESSED PER YEAR</b>
Hemp	30,000
Flax	15,000
Barley	3,000

**Production Efficiency: Lower costs of production to \$0.20 to \$0.25 range**

**Customer Acquisition: Intent is to grow the customer base**

We continue to expand our customer base and the type of work we are doing. We currently working a number of “hybrid” projects in which we are developing products as well as producing the materials.

**Job Growth - increasing the number of team members between 4 to 6**

We have added 2 new interns this past summer and through our collaborative work 3DFuel has added two new employees.

**Rural Development - expansion of facilities in Colfax, North Dakota**

We have decided to locate our newest production facility in Fargo, ND. Although it is Fargo, we are located in what is defined by the state of North Dakota as an Opportunity Zone, which is an area that is economically distressed area that needs investment.

**New Technology Development**

We recently tested a new technology in collaboration with ComDel Innovations to test the feasibility of utilizing rapid tooling that would lower the time and cost of bring a product to market. Our initial test was successful but will need further refinement. For this project we shared in the cost of development with ComDel and manufactured the tooling and the material for the trial.