ALBERTA INNOVATES

CLEAN RESOURCES

CLEAN TECHNOLOGY

BIOENERGY - WASTE CONVERSION

Converting Spent Grain to Biofuel using Thermal Vacuum Reactors

The Grizzly Paw Brewing Company, located in Canmore, Alberta, wanted to find a use for spent grain produced in the brewing process that would improve their waste management. In this project, Grizzly Paw partnered with Alberta-based Eco-Growth Environmental to demonstrate the use of organic waste dehydrators. The Thermal Vacuum Reactor is a sub-pyrolysis unit that converts organic waste into a condensed and highly calorific biofuel by reducing its moisture content, size and weight.

By reducing the amount of waste that Grizzly Paw handles, the company is reducing emissions and reducing transportation of waste materials. This solution could be used at other craft brewing locations as well as other businesses that produce organic waste and have on-site heating requirements.

FUNDING DETAILS

RECIPIENT:
The Grizzly Paw Pub & Brewing Company Ltd.

PARTNERS:
Eco-Growth Environmental Inc.

TOTAL BUDGET:
$141,515

AI FUNDING:
$70,750

PROJECT DATES:
OCT 2018 – DEC 2019

PROJECT TRL:
Start: 7
End: 8

APPLICATION

The Eco-Growth technology is designed to dehydrate spent grains and other organic wastes. The wet organics are processed into a powder-like material with a high calorific value. This biomass can be combusted in biofuel boilers to produce heat for other processes on site. This technology may be applicable for facilities that generate substantial amounts of organic waste, where composting is difficult or very expensive, and where significant quantities of heat or hot water is needed, like in public pools or laundry facilities.

ALBERTA INNOVATES

CLEAN RESOURCES

CLEAN TECHNOLOGY

BIOENERGY - WASTE CONVERSION

PROJECT GOALS

Grizzly Paw Brewing Company wanted to test the efficacy and applicability of the thermal vacuum reactors in their craft brewery. The project goals were to:

- Reduce transportation of the spent grain to landfill or feedlot by transforming heavy and wet spent grain into biofuel
- Replace natural gas consumption for process heating with spent grain biofuel
- Test and demonstrate an upscaled version of the Eco-Growth dryers, processing up to 1000 lbs (454 kg) per day of wet spent grain into biofuel
- Test and demonstrate the integration of the high efficiency heat exchangers into the thermal vacuum reactors to improve energy efficiency
- Demonstrate integration with the biomass boiler unit

BENEFITS TO ALBERTA

- **Economic:** There are potential cost savings to end-users that convert their organic wastes to biomass through reduced waste handling, transportation and tipping fees; reduced natural gas consumption for heating; and potential revenue from carbon tax credits when replacing natural gas consumption with biofuel.
- **Environmental:** Emissions reductions are possible when operations can realize reduced transportation of organic waste, reduced natural gas consumption for process heat, and reduced emissions generated during the landfilling of organic matter.
- **Community:** By diverting organic waste from landfill, communities can realize benefits of improved waste management. Communities can develop partnerships between producers of biomass for fuel and local users that have large demand for hot water or process heat.

1 New Products/Services

6 t/yr Project GHGs Reduced

6 t/yr Future GHGs Reduced

CURRENT STATUS

JAN 2020

Grizzly Paw Brewing Company has installed, commissioned and demonstrated the Eco-Growth organic waste dehydrators in their operations. The system was effective in processing the spent grains for use in a biomass boiler. While the process heat was not used on site at Grizzly Paw, the brewery has engaged with local partners that may be able to utilize the biofuel and offset energy consumption in the community.