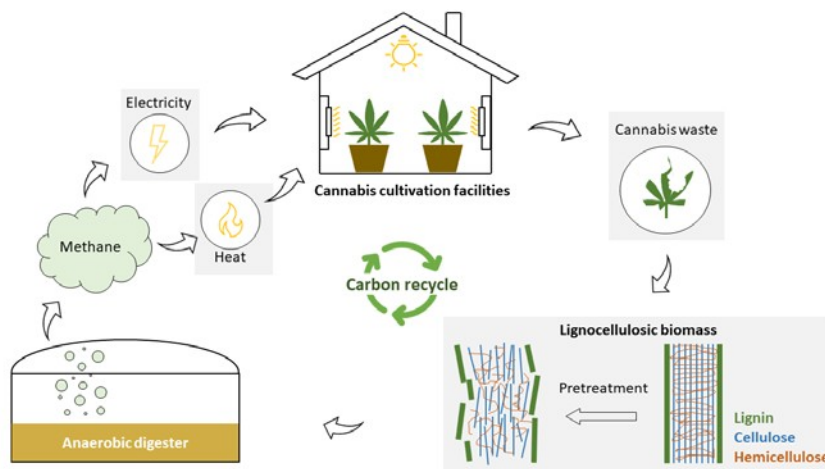


## Process Development For Cannabis Waste Management: On The Way To Sustainable Waste Disposal And Bioenergy Production

Cannabis waste is rich in lignocellulosic biomass, which can be recovered as a source of energy (in the form of methane) when treated by the anaerobic digestion process. Studies on the characterization and energy recovery from cannabis waste are generally lacking. This project aims to explore the options for cannabis waste treatment. The main focus is on the development and optimization of cannabis waste pretreatment and anaerobic digestion conditions needed for the effective cannabis waste management and energy recovery. The project will lead to the development of Alberta-made cannabis waste treatment processes fit for different scales of operation.



**RECIPIENT:**

**University of  
Alberta – Dr. Yang  
Liu**



**PARTNERS:**

**Atlas Growers**



**TOTAL BUDGET:**

**\$203,500**



**AI FUNDING:**

**\$99,500**



**PROJECT DATES:**

**OCT 2018 –  
MAR 2021**



**PROJECT TRL:**

**Start: 1-3  
End: 5**

### APPLICATION

The technology developed in this project generated new knowledge regarding applied cannabis waste management practices and opportunities to help improve the environmental footprint and operating costs of commercial cannabis cultivation and processing facilities. With properly designed systems, the methane produced from the anaerobic digestion of cannabis waste could be utilized for the generation of heat and electricity, creating new value from waste.

# ALBERTA INNOVATES CLEAN RESOURCES

## CLEAN TECHNOLOGY

### BIOENERGY & CIRCULAR ECONOMY – WASTE CONVERSION

#### PROJECT GOALS

- Develop and validate environmentally-sound and energy-efficient strategies for on-site treatment of cannabis waste that can reduce transportation and landfill needs and enhance biogas/energy production.
- Explore pretreatment strategies (4 methods and 15 conditions) for cannabis waste to improve hydrolysis rate and digestibility to optimize methane (biogas) production from the anaerobic digestion.
- Provide innovative, cost-effective technical solutions to address the stringent regulatory requirements associated with legalized cultivation of recreational cannabis.

#### BENEFITS TO ALBERTA

- Reduction of GHG emissions associated with growing cannabis by using biogas from cannabis waste to generate a portion of heat and light used cannabis growing facilities.
- Development of on-site anaerobic digestion processes for cannabis waste could reduce the land and other environmental impacts of disposal in landfill and conventional composting, as well as associated costs.
- Generation of new insight into the technical feasibility and potential for solutions to gradually replace current practices and serve new markets (such as smaller scale, decentralized and on-site organic waste disposal), particularly in regions where organic waste management is underdeveloped.



4 Publications



3 Students  
Trained



1 New  
Product/Service



3 kt/yr Future GHGs  
Reduced

#### CURRENT STATUS

#### JUN 2021 - COMPLETED

Increased methane production was observed with all cannabis waste pretreatments and all anaerobic digestion trials using co-digestion of cannabis waste mixed with municipal wastewater (blackwater). When energy input for pretreatment was considered, however, co-digestion of blackwater and cannabis waste without pretreatment achieved the highest net energy output in laboratory conditions. The project included characterization of the cannabis waste, and observation of microbial population changes during the process. A Public Report is available after October 2021.