

# CLEAN RESOURCES

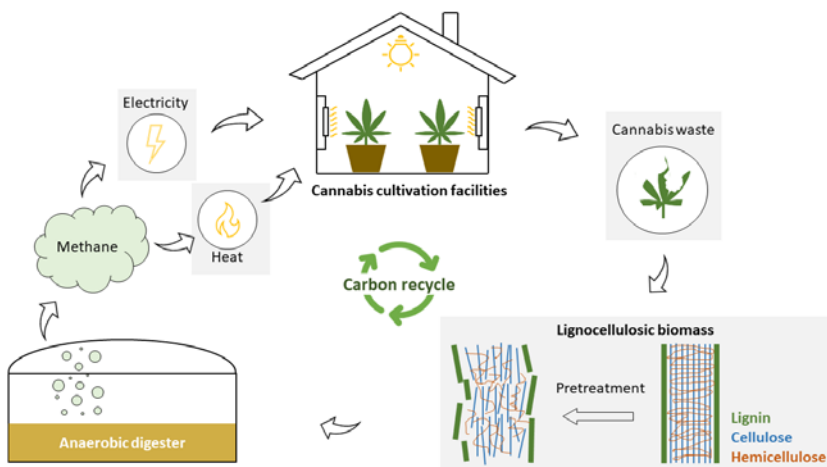
## CLEAN TECHNOLOGY

### BIOENERGY – DIVERSION OF RESIDUES AND WASTES

## FUNDING DETAILS

## 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 – Aug 2020



### PROJECT TRL:

Start: 1 - 3  
End: 4 - 6

## APPLICATION

The technology developed in this project will generate knowledge regarding applied cannabis waste management practices. It will help reduce the energy and economic footprints of the on-site disposal of cannabis waste generated at commercial cannabis cultivation and processing facilities. With properly designed systems, the methane generated from the anaerobic digestion process can be collected and utilized to provide heat and electricity resulting in the energy-efficient cannabis cultivation and to value-added cannabis waste treatment processes.



## 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 for cannabis waste to improve hydrolysis rate and digestibility for optimized methane production from the anaerobic digestion process.
- Provide solutions addressing the increasing technical needs for innovative and cost-effective strategies for the disposal of cannabis waste that arose with the legalization of recreational cannabis cultivation.

## BENEFITS TO ALBERTA

- Development of an on-site anaerobic digestion process for the cannabis waste could reduce the need for landfill space compared to conventional composting and landfilling methods.
- Reduction of GHG emissions associated with growing cannabis by using biomethane produced from the anaerobic digestion to generate a portion of heat and light used for the growth of cannabis plants.
- Gaining insight into the technical feasibility, and guide to solutions to gradually replace current practices and serve new markets (such as decentralized systems and on-site organic waste disposal), particularly in regions where organic waste management is underdeveloped.



2 Publications



3 Students Trained



1 New Products/Services



<1 kT/yr Future GHGs Reduced

## CURRENT STATUS

### May 2020 – In Progress

Different types of cannabis waste have been characterized. Four pretreatment methods and fifteen pretreatment conditions have been selected and evaluated for their effects on improving the hydrolysis rate and digestibility of cannabis waste. Pretreatment is shown to increase hydrolysis rate. Co-digestion of pretreated cannabis waste with municipal wastewater shows the highest biomethane production. Further process optimization is in progress.