

A.D.E.P.T

● ANAEROBIC DIGESTION
AND ETHANOL PULP TREATMENT

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TEAM DESERT

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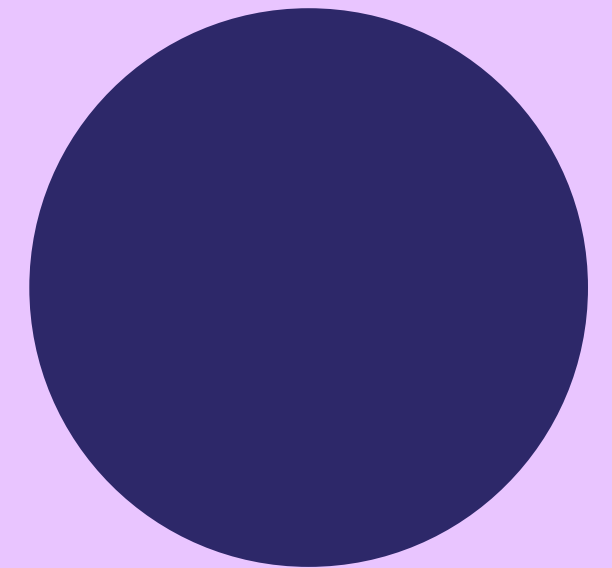
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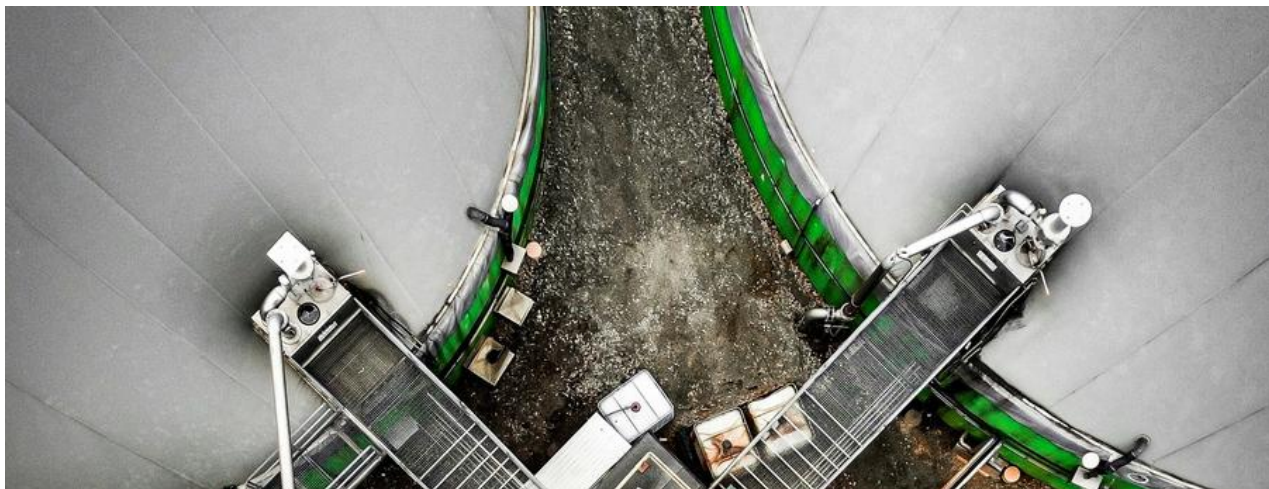


Problem Statement

Develop a process to produce and use biofuel(s) to address the energy poverty crisis in Indigenous communities while considering their values and beliefs



Limitations



01 BIOFUEL EFFICIENCY

- Significantly less efficient than fossil fuels
 - Requires too much land
 - Requires too much resource

02 FURNACE COMPATABILITY

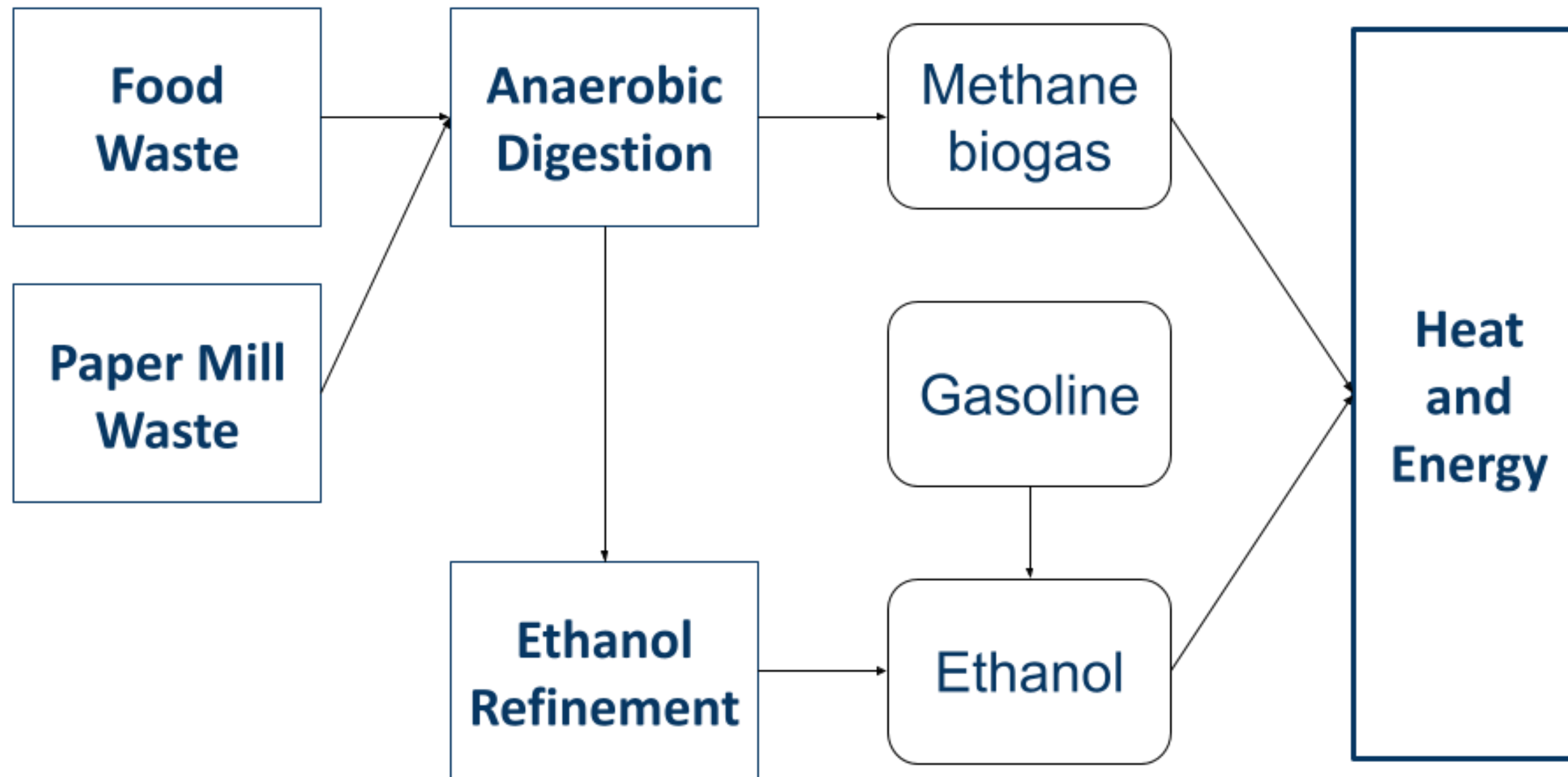
- Current furnaces are not compatible with B100 fuel

03 COMMUNITY ACCEPTANCE

- Past between industry and Indigenous peoples

Our Solution

A.D.E.P.T



Anaerobic Digestors

4 CHEMICAL PROCESSES

- Hydrolysis
- Acidogenesis
- Acetogenesis
- Methanogenesis

TYPE OF DIGESTER SELECTED

- Plug Digester
 - Multi faceted
 - Can accommodate 20% solid material
 - Input correlates to output



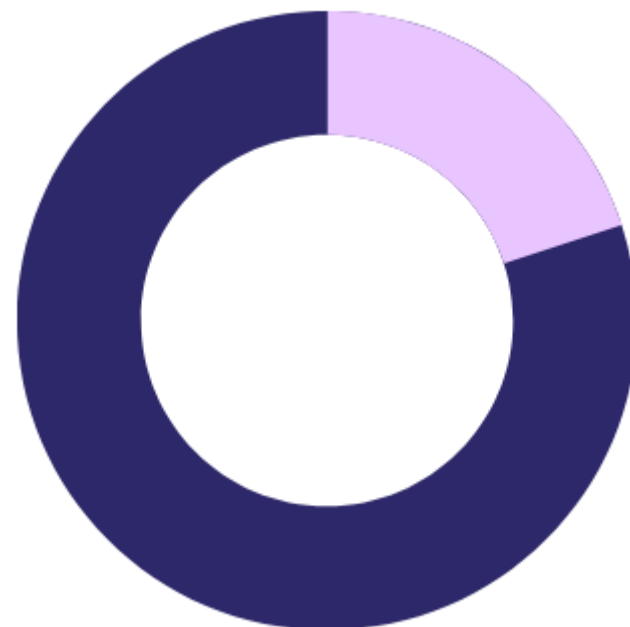
Ethanol Refinement

PROCESS:

- Mix carbon digestate
- Let sit for 48h
- Heat

FINAL PRODUCT

- Biofuel: B20



20 % ethanol
80%
gasoline



Biofuel Application

METHANE BIOGAS

- Various Energy Applications
 - Heating
 - Cooking
 - Fireplaces

B20 BIOFUEL

- Heating homes
- Saves more than \$1,100 per household per year



Logistics

LOCATION

Terrace Bay, Ontario

- Paper mill
 - Can be refurbished
- Proximity to Indigenous Communities
 - Pays Plat First Nations
 - Biigtigong Nishnaabeg (Ojibways of the Pic River First Nation)

TRUCKS

- Garbage Trucks
 - Waste shipment
- Tank Trucks
 - Ethanol Transportation



Cost Analysis

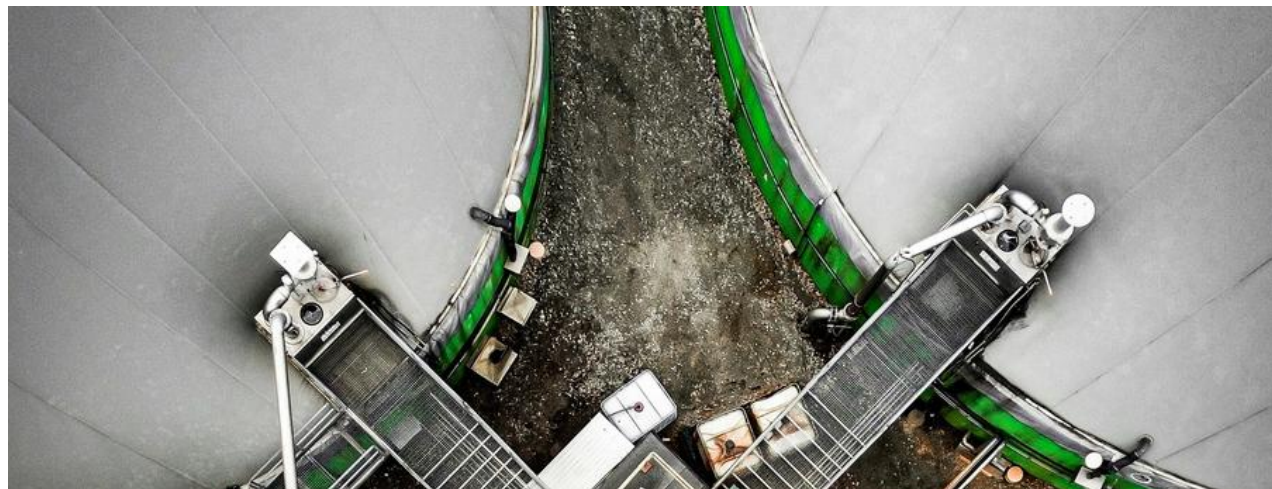
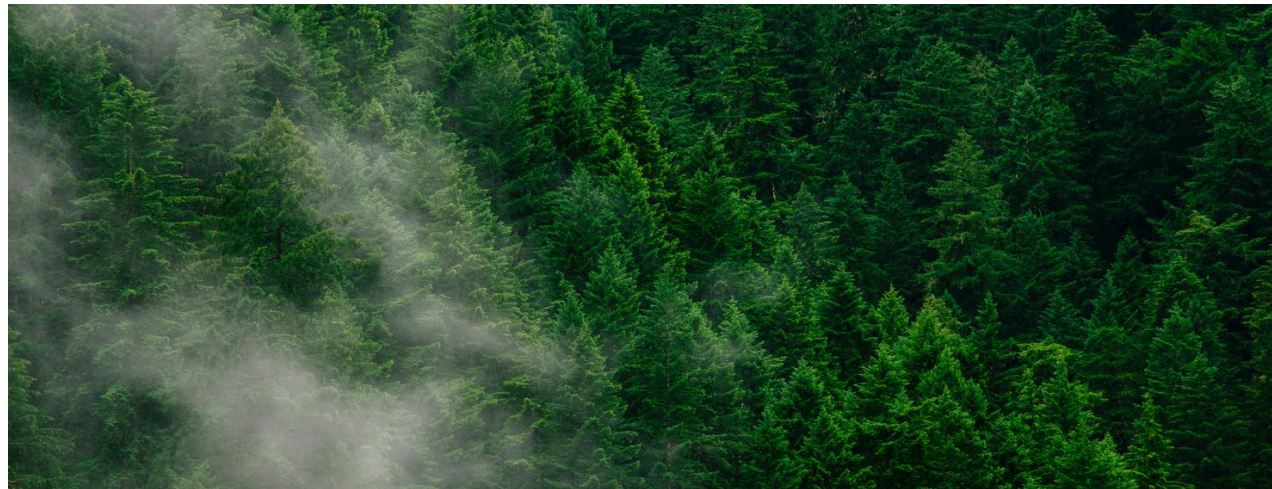
Initial Costs

Item	Cost (USD)
Anaerobic Digester Construction	~1,200,000
Ethanol Refinery Refurbishment	~400,000

Ongoing Costs

Item	Running Cost (USD)
Anaerobic Digester	~300,000/year
Ethanol Refinery	~0.60/gallon
Shipping of Raw Material	~6/mile

Next Steps



01 IMPROVED FURNACES

- Furnaces that can use 100% ethanol

02 IMPROVED BIOFUEL TECHNOLOGY

- Research and technological advancements
- Improved efficiency of biofuel

02 COLLABORATIVE GROWTH

- Opportunity for industry and Indigenous communities to develop together

Thank You



● IN SUMMARY:

- Anaerobic digestion and ethanol refinement used to create B20 (biofuel) and methane [slides 6,7]
- Uses of biofuel:
 - heating homes and electricity [slide 8]

Resources

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