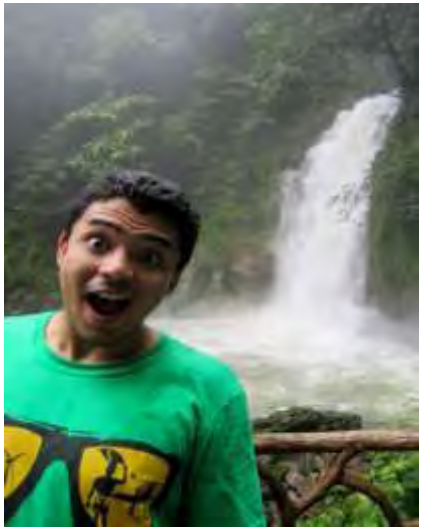
Biobeer Inc.

- **Michael Sherman**
- **APA Florida Conference**
- **9 September 2015**

Department of Urban & Regional Planning

A little about myself

- 2nd year graduate student at Florida State University studying Transportation and Land-Use Planning
- Studied abroad through the Green Program in Costa Rica to learn more about Alternative Energy



Outline

- Background information
- Methodology
- Findings
- Future Research

Background Info

- Inspiration for this is achieving sustainability(3 E's), particularly environment
- Create a biofuel by utilizing waste beer
- Facility Siting: location is key
- Planner's role: Evaluating potential benefits and feasibility of project

Findings

Resources:

Beer yeast, waste beer during production line, expired beer from keg returns, and seasonal overproduction

Products:

- Ethanol

ethyl alcohol, CH_3CH_2OH

- Water
- CO_2
- Some byproducts

Methodology

- Business Model
- Technology

Business Model

- Overall Capstone Idea
- Target audience
- Marketing
- Feasibility

Key factors

- Capacity: 21 million gallons/year of ethanol
- Technology: distillation
- Working with 7 major breweries

Project Timeline

- Feasibility study
- Obtain permitting for building bio-refinery
- Design & Construction
- Operation

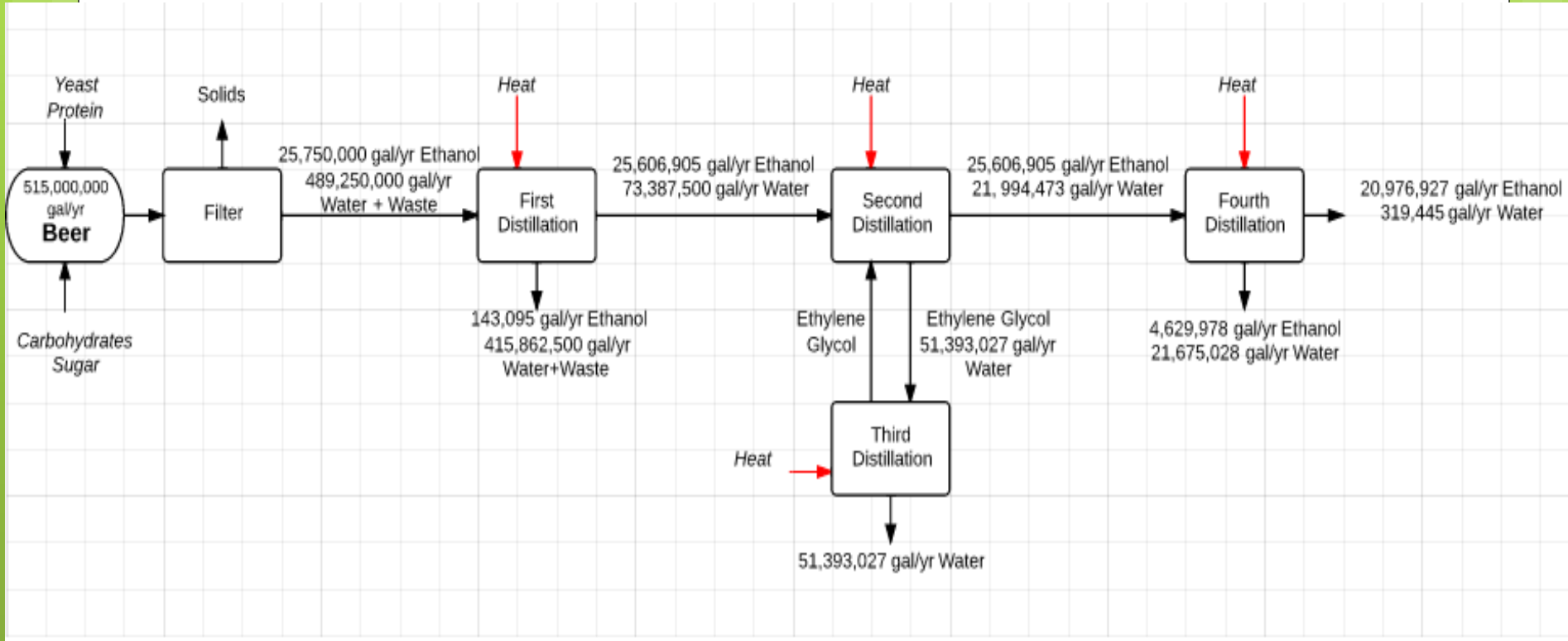
Location

- Abundance of breweries in Milwaukee, WI
- Location of breweries are within an 8 mile radius
- Direct access to I-94, I-43, I-794, and major arterial roads

Transportation

- Depending on the amounts of waste beer each establishment accumulates will determine a schedule & route for picking up waste beer.

Technology


Yeast
Protein
515,000,000 gal/yr
Beer
Carbohydrates
Sugar
Filter
Solids
25,750,000 gal/yr Ethanol
489,250,000 gal/yr
Water + Waste
Heat
First Distillation
143,095 gal/yr Ethanol
415,862,500 gal/yr
Water+Waste
25,606,905 gal/yr Ethanol
73,387,500 gal/yr Water
Heat
Second Distillation
Ethylene Glycol
Ethylene Glycol
51,393,027 gal/yr
Water
Heat
Third Distillation
51,393,027 gal/yr Water
25,606,905 gal/yr Ethanol
21, 994,473 gal/yr Water
Heat
Fourth Distillation
4,629,978 gal/yr Ethanol
21,675,028 gal/yr Water
20,976,927 gal/yr Ethanol
319,445 gal/yr Water

Findings

- Accounting and Financial Data
- Environmental Impacts
- Policy Infrastructure
- Social Impact

Accounting & Financial Data

- Initial investment - $50 million
- O&M- $6.4 million
- Annual Revenue - $55 million
- Lifetime of operation - ~25 years

Government subsidies

- Subsidies provided by federal government amounts to $0.20 per energy equivalent 1 liter of gasoline
- Wisconsin property tax break

Environmental Impact

- Land use: low
- Water use: low
- Aesthetic: low; no impact on residential area
- Air pollutants: CO2, S02, or any Particulate Matter(PM) (All below EPA Pollutant threshold)

Biobeer Co. will obtain an Environmental Impact Assessment(EIA) and will meet requirements of all related regulations

Permitting and regulation

- **At the federal level**

-Solid waste permit
withdrawal
-Air construction permit
-Emergency planning (EPCRA)
-Federal Clean Air Act
-Nat'l Environmental Policy Act
-Clean Water Act
-Safe Drinking Water Act
-Pollution Prevention Act

At local & regional level

- groundwater

- land use permit
-landfill permit

Social Impact

- Sustainability
  - Carbon neutral, alternative to fossil fuel
- Jobs
  - Milwaukee & surrounding areas
- Community reputation
- Education

Future Research

- Areas in Florida that may benefit from these facilities
- Other waste products that can create biofuels

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- **Lulia Murgescu**, Electrical Engineer, University of Delaware

- Any questions or comments?