SUGARCANE BIOENERGY POTENTIAL

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Current Business Model

Cane Plant

Bagasse
- Raw Sugar
- Specialty Sugar

Cane Juice

Molasses
- Cattle Feed

Trash Fiber

Steam

Electricity
Cane Composition

- Sugars in Stalk: 29.0%
- Stalk Fiber: 37.2%
- Trash Fiber: 33.8%
BIO-BASED ELECTRICITY
Electricity Production, 2005

**Generation**
- Steam: 183,468 MWh (87%)
- Hydro: 28,180 MWh (13%)

**Distribution**
- Consumption: 115,399 MWh
- Utility Sales: 96,249 MWh
  - 7% of Maui’s need
  - Firm power

- Pie chart showing 87% Steam and 13% Hydro for Generation.
- Pie chart showing 55% Consumption and 45% Utility Sales for Distribution.
**Biomass to Energy Model**

- **Cane Plant**
  - **Bagasse**
    - **Raw Sugar**
    - **Specialty Sugar**
  - **Cane Juice**
  - **Molasses**
  - **Trash Fiber**
    - **Cattle Feed**

**Steam**

**Electricity**

- Electricity generation double per ton cane
- Potential feedstock for cellulosic ethanol
BIOFUELS
Ethanol Distillery

- Proven technology
- Used throughout world sugar industry
- 5 MGPY for HC&S on 300 day operation using molasses only
Brazilian Ethanol Distillery

- 40 MGPY capacity
- 200 day season
- Flexibility in sugar or ethanol production
- 70 new mills being built for sugar/ethanol
Ethanol Production Model

Cane Plant

- Bagasse
- Cane Juice
  - Raw Sugar
  - Specialty Sugar
- Molasses
- Trash Fiber

Steam

Electricity

Fermentation

~ 5 MGPY molasses only
> 10 MGPY with juice

Ethanol
Ethanol Distillery Outputs

1. Ethanol
   - Anhydrous denatured alcohol, 99.5%
   - Must meet ASTM standard D4806-04a
   - Cane juice more expensive feedstock

2. Vinasse
   - 12 to 1 volume ratio of vinasse to ethanol
   - Treatment requires AD or concentration
   - Potential potassium fertilizer replacement
Value Added Co-Products Role

PREMIUM MAUI GOLD

It takes time and handcrafting to achieve the lustrous crystals and rich sugarcane taste that make our Premium Maui Gold the choicest, unrefined gourmet sugar available. Use PMG to catch the taste of your favorite foods and beverages.

MAUI BRAND NATURAL CANE SUGAR

NATURAL WHITE

The natural alternative all-purpose sweetener, our light in color Natural White cane sugar lends just a hint of old-fashioned cane sugar flavor. Unlike refined sweeteners that can mask flavors, Natural White enhances the taste of beverages and recipes.
Summary

- Sugarcane provides significant bio-based firm power electricity production on Maui with potential for more

- Ethanol production potential of 5 MGPY from molasses with higher capacities using other sugar feedstocks

- Vinasse volume poses significant operational issues for treatment and utilization

- Value-added co-products will play an important role in enhancing financial viability of bioenergy initiatives