University of Iowa – Facilities Management & Office of Sustainability

Final Presentation - Biomass Project
March 10, 2010

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Why Biomass?

- University of Iowa 2020 Sustainability Goals
- 40% biomass to fuel the University
- 3 boilers, looking at fuel for one specifically
- Due to how it is set up, need a fuel that resembles coal
- Of biomass, wood chips are the ones closest to resembling and burning like coal
- Wood chips are also able to be grown here, with the possibility of long-term contracts
Biomass Project Lifecycle

1. Identify University’s needs for fuel
2. Identify type of fuel and machine specifications
3. Identify market
4. Reach out to market
5. Create business model
6. Create boundaries within which to produce fuel
7. Solve logistics (harvesting, storage, transportation)
8. Sign up fuel producers in contracts
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Best Practices Research: Initial Findings

• Several universities are utilizing woody biomass
  – Pattern of exploiting unique opportunities
    • Ex. Relationships with timber operations-Montana, S. Carolina
    • Ex. Relationship with State Forestry Management- Colorado St

No “one size fits all” approach
Iowa must be cognizant of how unique local conditions will shape their opportunities and obstacles
Best Practices Research: University of Missouri

- The University of Missouri is a comparable example to that of Iowa
  - Require 100,000 tons of biomass annually
  - Share many similar geographic features
  - Intends to facilitate growth of woody biomass
Best Practices Research: University of Missouri

- Intend to source 100,000 tons from three sources
  - 1/3 from waste stream sources
  - 1/3 from forestry management
  - 1/3 from growing woody biomass
- Exploring options to grow woody biomass in areas affected by flooding in the 90’s
- Land is no longer viable for traditional row crops but is suitable for willow and cottonwood trees
Best Practices Research: University of Missouri

- Operations and Logistics
  - Cut the tops off of trees after first year
  - Harvest trees every three years, with a life cycle of six harvests
  - Estimated production of 9-13 tons of woody biomass per acre every three years
  - Working with New Holland to design and develop appropriate machinery
Available Land for Biomass Production – Iowa City Region

- US Census website research
  - Navigated to the 2007 Agricultural Census (latest version available online)
  - Found data for Johnson County and the 9 surrounding counties
  - Created a spreadsheet and interpolated data to find:
    - Total Land in Farms: 3,115,477 Acres
    - Total Crop Land in Farms: 2,338,146 Acres
    - Total Non-Crop Land in Farms: 777,331 Acres
    - Total Land in CRP: 253,363 Acres
    - Total Non-Crop, Non-CRP Land: 523,968 Acres
    - Land not in Farms: 615,824 Acres

- Using University of Missouri estimate of 9-13 tons per acre per 3 year period
  - Results in a conservative estimate, assuming all available Non-Crop, Non-CRP Land in farms, of:
    - Approximately 1.5 million tons/year yield potential
Available Land for Biomass Production – Clear Creek Basin

• Over 66,000 acres, most within 50 miles of UI
• 23% ungrazed grassland, 8% deciduous forest, 5% CRP grassland
• Major conservation initiatives in place, including tree planting
• Significant land owned by Amana Farms Inc.
• forested areas near Lake Macbride and Amana.
March 4th, 2010 Information Session

• Reps. from Iowa Valley RC&D, USDA/NRCS, Amana Farms Inc.
• Strong interest expressed, collaboration likely
• Strategies:
  – Sourcing from Amana Farms Inc.
  – Non-farm land (river bottom, flood plain)
  – Forestry management
  – Private entity to handle harvesting, chipping, storage, transport.
Farmer Cooperatives

- Approximately five different cooperatives companies identified
- Several have multiple locations within 50 miles of Iowa City
- Cooperative Contact – Gary Swenka
  - President of the Board – Consumers Cooperative
  - Located outside of Iowa City
- Wood Products of Iowa
  - Specializes in chipping wood
  - Currently sells wood chips for landscaping
Future contact at Iowa State University

- Dr. Richard Hall
  - Provided assistance to the University of Missouri
  - Conducted a report on woody biomass capabilities in the Midwest, including eastern Iowa
  - Committed to being in continued contact with our team to share best practice expertise
Amount of Biomass

- University needs: 100,000 tons woody biomass annually to make 2020 sustainability goals
- If 10% of non-crop, non-CRP land is used, would be up to 150,000 tons of woody biomass
- If 10% of Clear Creek Basin: 20,000 tons
- If 500 acres forestry mgt/year: 15,000 tons
- Other waste stream: 80,000 tons/year of cardboard waste
Potential Business Models

- New state employee staff under Facilities Management
- Create a non-profit with input from the University
- Create a private company/LLC
- Work with current private wood chip company
Next Steps

• Identify/reach out to market
  – Contact farmers through cooperatives
  – Land owner mailing database
  – Contact farmers in Clear Creek Basin

• Create boundaries within which to produce fuel

• Create business model
  – Work with entrepreneurial center and possibly non-profit center to create business plan

• Solve logistics (harvesting, storage, transportation)

• Sign up fuel producers in contracts
Change Management and Biomass

1. Establish a sense of urgency
2. Create the guiding coalition
3. Developing a vision and strategy
4. Communicate the change vision
5. Empower employees for broad-based action
6. Generate short-term wins
7. Consolidate gains and produce more change
8. Anchor new approaches in the culture
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Questions?