BIOENERGY PERCEPTION STUDY

Robert Radics - PhD Student
Priscilla Morris – Masters Student
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Advisors: Dr. Sudipta Dasmohapatra & Dr. Steve Kelley

http://propelfuels.com/about_us/our_stations

Sponsored by USDA Forest Service, NIFA
IMPORTANCE OF BIOFUELS

- Limited source of fossil energy
- Global warming
- Sustainability
- Energy security
- Rural development

http://vimeo.com/auburnresearch/ibss
THE SOUTHEAST PARTNERSHIP FOR INTEGRATED BIOMASS SUPPLY SYSTEMS (IBSS)

Goals:
- Provide implementable ‘real world’ solutions;
- Manage technological, economical, and social barriers → decrease risks;
- Maximize societal gains;
- Develop tools for supporting impact evaluation and decision making;
- Provide high impact education and communication tool for all stakeholders.
RESEARCH OBJECTIVE

To examine stakeholders’ perception of bioenergy industry and biofuels

Expected Outcomes:

- Inform the industry about gaps in stakeholders’ understanding of the bioenergy industry;
- Use the results to develop education and communication tools for stakeholders;
- Conduct social impact analysis (social LCA) - Case studies.
Literature Review

– Only selected **stakeholder** groups included;
– Lack of **extensive** and **integrated** stakeholder studies;
– Lack of focus on **South East US** about biofuels;
– Lack of **social impact assessment studies**;
– Focus on bioenergy but only **few studies on biofuel**.
Literature Review

1. Perception depends on:
   - Stakeholder group;
   - Geographical region;
   - The time of study;
   - Market maturity.

2. Specific terms that consumers can relate to should be used;
3. Price/cost of biofuels;
4. National security;
5. Improvement of local economy.

METHODOLOGY
TARGETED STAKEHOLDERS

Venture Capitalists
Consumers
Rural communities
Government
Forest landowners, Farmers
Industry
NGO
Research Community

METHODOLOGY

Scope: NC and TN consumers

Data collection

- Instrument: Web based surveys
- Sampling frame: 6 millions NC, 2 millions TN
- Sample: Randomly selected email addresses (100k by state)
- Time period: April-July
- Expected response: 1000 by state
- Pilot: General public and industry

RESULT OF PILOT SURVEYS (n=34)

Evaluate your level of concern about different environmental topics

<table>
<thead>
<tr>
<th>Not at all concerned (1)</th>
<th>Moderately concerned (2)</th>
<th>Neutral (3)</th>
<th>Concerned (4)</th>
<th>Extremely concerned (5)</th>
</tr>
</thead>
</table>

Most concerned:
- Unemployment (Mean: 4.19)
- Increasing global population

Less concerned:
- Decreasing fossil energy reserves (Mean 3.56)
- U.S. Dependence on foreign oil

Unemployment

- Extremely Concerned: 43.8%
- Concerned: 37.5%
- Neutral: 6.3%
- A Little Concerned: 12.5%

Decreasing fossil energy reserves

- Extremely Concerned: 18.8%
- Not at all Concerned: 6.3%
- A Little Concerned: 12.5%
- Neutral: 18.8%
- Concerned: 43.8%
If biofuel for transportation was available at gas stations, what are the most important factors to choose biofuel

<table>
<thead>
<tr>
<th>Extremely unimportant (1)</th>
<th>Unimportant (2)</th>
<th>Neither important nor unimportant (3)</th>
<th>Important (4)</th>
<th>Extremely unimportant (5)</th>
</tr>
</thead>
</table>

**Most important:**
- Vehicle compatibility (4.50),
- Biofuel will not change engine lifetime,
- Price.

**Less important:**
- My colleagues/neighbors/family opinion (2.5),
- Tax breaks.

**My vehicle compatibility with biofuel**

- Extremely important or inevitable: 68.8%
- Important: 25.0%
- Neither important nor unimportant: 6.3%
- Unimportant: 3.9%
- Extremely unimportant: 0.0%

**Colleagues’/neighbors’/family’s opinion about biofuels**

- Important: 18.8%
- Neither unimportant nor important: 25.0%
- Neither important nor unimportant: 18.8%
- Unimportant: 37.5%
- Extremely unimportant: 0.0%
## Result of Pilot Surveys

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neither agree nor disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
</tr>
</tbody>
</table>

### Energy Security
- Reduce US dependence on foreign oil,
- Produce biofuels to meet our country’s energy demand

### Source
- Grasses can be used for producing biofuel
- Trees can be used for producing biofuel
- Landfill wastes could be a valuable source of bioenergy

### Price
- I would purchase biofuels even if it is a little more expensive than gasoline

### Jobs
- Investment in biofuel industry creates jobs
- Biofuel refineries in my region provide jobs

### Miscellaneous
- I would like my local power provider to use renewable fuels sources
- I would support the cutting of trees for biofuels if trees were replanted in the same place

### Less Agreed One:
- I think biofuels made from trees will cause groceries to be more expensive
PERCEPTIONS OF FOREST AND FARM LANDOWNERS

Source: ecfla.org
Methodology

• Scope: NC, TN
• Data Collection
  – Instrument: Mail Surveys
  – Sampling Frame
  – Time Period: April-September 2013
  – Expected Response: 250 Forest and 250 Farm from each state
  – Pilot: Informed interest groups within the forestry industry - 18 responses 16 complete
Sampling Method

- **State Database**
  - US Forest Service: Forest Inventory Analysis
  - USDA: County Agriculture Fact Sheets

- **County Database:**
  - NC and TN are both geographically divided into three regions

![Diagram of County Distribution within the state of NC](image1.png)

![Diagram of County Distribution within the state of TN](image2.png)
State County Selections

Selected 25 Counties in North Carolina

Selected Counties in Tennessee

Map of North Carolina and Tennessee created using GIS Mapping Software
**Forest Landowner Survey**

1. Do you own forestland in North Carolina?
   - [ ] No  Please stop here and return the survey in the postage paid envelope
   - [ ] Yes  Please continue to question 2

2. What (are) the ZIP/postal code(s) at which your forestland(s) is (are) located?
   __________

3. What is your gender?
   - [ ] Male
   - [ ] Female

4. What is your year of birth? __________

5. Please indicate your educational background?
   - Years of High School completed __________
   - Years of College completed __________

6. What was your total household income in 2012 (include all income earners in your household)?
   - [ ] Under $25,000
   - [ ] $25,000 to less than $50,000
   - [ ] $50,000 to less than $100,000
   - [ ] $100,000 to less than $150,000
   - [ ] $150,000 and over
   - [ ] Prefer not to answer

7. Which of the following best describes your ethnicity (please select all that apply)?
   - [ ] White/Caucasian
   - [ ] Black/African-American
   - [ ] American Indian/Native American
   - [ ] Asian/Oriental
   - [ ] Native Hawaiian or Other Pacific Islander
   - [ ] Hispanic/Latino
   - [ ] Some Other Race (please specify) __________
   - [ ] Prefer not to answer

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<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Don't Care/ Neutral</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>In my opinion, domestically produced fuel is critical to the nation's national security</td>
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<td>I would like more information about the economics of growing and supplying wood for biofuels or biopower</td>
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<td>In my opinion, bio-based fuel is an alternative to petroleum-based fuels</td>
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<td>I have sought professional advice about growing woody biomass for energy</td>
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<td>In my opinion, woody residues (left on forest site) when used for bioenergy purposes provides more value to the landowner than other uses</td>
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<tr>
<td>In my opinion, growing biomass for bioenergy is not profitable</td>
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<tr>
<td>In my opinion, the government should provide cost share programs for forest landowners willing to produce biomass for bioenergy</td>
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Crops likely to plant as a Forest Landowner

AS A FOREST LANDOWNER WHICH CROPS WOULD YOU BE MORE LIKELY TO PLANT FOR BIOENERGY PURPOSES?

- Softwoods: 50%
- Mixed: 20%
- Hardwood: 20%
- Short Rotation Woody Crops: 10%
Top 3 and Bottom 2 Agreement Statements

• 4.8 In my opinion, domestically produced fuel is critical to the nation’s national security
• 4.6 I would like to learn more about growing and harvesting wood for bioenergy (biofuels & biopower)
• 4.6 Wood/trees are currently being used in my state for producing power/electricity
• 1.07 In my opinion, growing biomass for bioenergy is not profitable
• 1 In my opinion, biofuel production from trees is not environmentally friendly
**Next Steps**

Conduct consumer and landowner surveys
- Send out email for consumers, mail to landowners
- Data collection,
- Interpret results

Conduct surveys for other stakeholder groups

Plan educational tools, other actions by stakeholder group
Questions?


Cited References Cont’d

WHICH OF THE FOLLOWING SOURCES OF BIOENERGY ARE YOU AWARE OF?

- Used Cooking Oil: 11%
- Corn: 11%
- Food Crops: 8%
- Grasses: 10%
- Forest Residues/Trees: 10%
- Genetically Modified Trees: 8%
- Genetically Modified Agriculture crops: 7%
- Mill Residues: 9%
- Landfill Wastes: 11%
- Agriculture Residues/Crops: 10%
- Algae: 5%
Open ended responses

• What type of information would you need in order to grow trees for bioenergy purposes?
  – Type of wood needed. Sites that will be most productive. Tree sources that will be most productive on the designated sites. Management plans to achieve this goal. Cost and timing for harvest schedule and income schedule from crop. Guarantee for market and price.
  – There would have to be a market equal to or better than pulpwood
  – Cost of planting, length of rotation, tons of fiber per acre produced during rotation and expected price per ton to landowner.
I Don’t Know Responses

• I would supply forest residues/trees to produce bioenergy
• I believe that it is profitable to grow and sell wood to the bio-power industry (electricity) vs. other forestry markets (e.g., pulp)
• I believe that it is profitable to grow and sell wood for the biofuels industry vs. other forestry markets (e.g., pulp)
• I am aware that genetically modified trees are currently being grown for energy (biofuels & biopower)
• I have heard of short rotation trees as a source of bioenergy (biofuels for transportation)
• I believe it will be profitable to grow grasses in addition to timber in my forest land for energy purpose
THANK YOU FOR YOUR ATTENTION!

Questions?

DATA COLLECTION SOFTWARE - QUALTRICS

online survey software

http://www.qualtrics.com/blog/about-qualtrics/
IBM Product

SPSS predictive analytics software, you can predict with confidence what will happen next.
ANALYSIS SOFTWARE - SPSS
DATA COLLECTION SOFTWARE - QUALTRICS
**Questions on:**
- Demographics
- Environmental consciousness
- Biofuel