U.P. Biofuels Cooperative Strategy

Roger Woods
School of Business and Economics
Michigan Technological University

Prepared for Western Upper Peninsula Planning and Development Region
October 2013

Michigan Technological University
1400 Townsend Drive
Houghton, Michigan 49931 USA

Email: rhwoods@mtu.edu
Web: www.mtu.edu

Executive Summary

Economically the Western Upper Peninsula of Michigan has struggled since the closing of the Copper Range Company's facility in White Pine and the recent closure of the Smurfit-Stone plant in Ontonagon. Available as an untapped resource is the large acreage of retired farm lands that are currently not producing income or livelihood for their owners. The recent federal and state mandates to produce energy using renewable resources could leverage the retired farm lands to produce renewable biomass energy.

Currently, the Upper Peninsula of Michigan has a 20 megawatt electrical facility that is feed by woody biomass along with smaller schools and municipal entities also using biomass as a fuel source. Recently it was announced that an electrical facility in Escanaba will be converted to biomass as its fuel source. These trends indicate that there will be a market for woody biomass in the future that could be economically grown on the retired farm land in Ontonagon and Gogebic counties.

Funding was obtained through a CAIP (Community Adjustment and Investment Program) grant by the Western Upper Peninsula Planning and Development Region (WUPPDR) to research the feasibility of planting biomass on retired farmlands. The research determined that planting of hybrid poplars would be economically feasible to landowners. The issue is that in order to receive a return on their investment, landowners will wait 10 years before harvest. The grant also funded the exploration of developing a cooperative to enable land owners to plant, manage and harvest hybrid poplar.

A cooperative would allow landowners to access products and services that might not be otherwise accessible as an individual, possibly making it more economically advantageous to plant hybrid poplar. The cooperative will focus on contracting with others to potentially reduce the costs of planting, maintenance and harvesting. In order for the cooperative to be successful it must have a critical mass of member-owners to be economically viable.

Presentations were held to communicate the economic feasibility to the landowner concerning planting hybrid poplar and the formation of the cooperative. The level of interest at this point has been relatively low compared to the number of potential landowners. Through these presentations and funding a small steering committee has been developed to investigate the feasibility of developing a cooperative to assist landowners in developing hybrid poplar plantings.

Table of Contents

Background

This strategy report is the final portion of a CAIP (Community Adjustment and Investment Program) grant that was secured by the Western Upper Peninsula Planning and Development Region (WUPPDR). This report relies heavily on the previous work done by Dr. Robert Froese and Mr. Zane Abbot in the "Energy Crop Opportunities in the Western Upper Peninsula of Michigan" which was also done through the CAIP funding. Based on the results of that report, this cooperative strategy outlines how a cooperative could enable the planting and harvesting of hybrid poplar to be feasible for the landowner.

The CAIP grant included engagement with landowners through two general presentations, presentations in each county and individual land assessments as requested. In June of 2011 an initial presentation was held at Michigan Technological University (MTU) to inform and educate landowners about biofuels and to gauge interest in planting and harvesting biofuels. The focus was on converting unused farm land to plant a woody biomass for later sale in energy production or possibly wood pellets.

The second presentation at MTU in 2012 detailed the results of the research work done by Dr. Froese and Zane Abbott concerning the optimum biofuel to be grown in the western UP of Michigan and the opportunities to develop a cooperative to plan, manage and market the biofuels. The cooperative presentation introduced the cooperative business model, its benefits and how it might enable biofuel production.

Throughout the summer of 2012 the cooperative presentation and the biofuel research study results were presented in four counties. The "roadshow" attempted to engage the landowners in the cooperative model and encourage them to schedule a land assessment. The land assessments were done by a summer intern forestry major that went to the property and provided a detailed assessment of suitability for biofuel production on their land.

In the July of 2013 a presentation was done in Bruce Crossing to outline the possible cooperative strategy and to engage landowners in joining the cooperative. This document describes the possible cooperative strategy that was presented at that meeting.

Market Analysis

Current Demand

The planting, managing and harvesting of a biofuel requires a market to purchase the product at the end of the growing cycle. The current and possible future demand was researched to provide an understanding of the feasibility to a landowner and the possible cooperative.

Current local demand in terms of dry tons

L'Anse Warden – approximately 150,000 tons per year
Ontonagon Schools
CLK Schools – 2,000 tons a year
Escanaba (proposed) 300,000 tons a year
Round wood (paper mills)
Wood pellets

Future Demand

The current price of natural gas has impacted the use of biofuels as an energy source, but the state and federal mandates to produce a certain percentage of energy (10% in Michigan by 2015[1]) through renewable sources will potentially increase demand for biofuels. In June of 2013 it was announced that the electric plant in Escanaba will be converted to biofuels. Traxys, who owns and operates L'Anse Warden, could also convert their plant in White Pine to utilize biofuels.

Federal programs may increase demand by creating incentives for businesses, schools and organizations to convert to using biomass. Currently such programs as the Community Wood Energy Program[2] assist local governments with the capital costs of installing high-efficiency, biomass-fueled heating systems. These programs might increase the demand for local sources of woody biomass in the future.

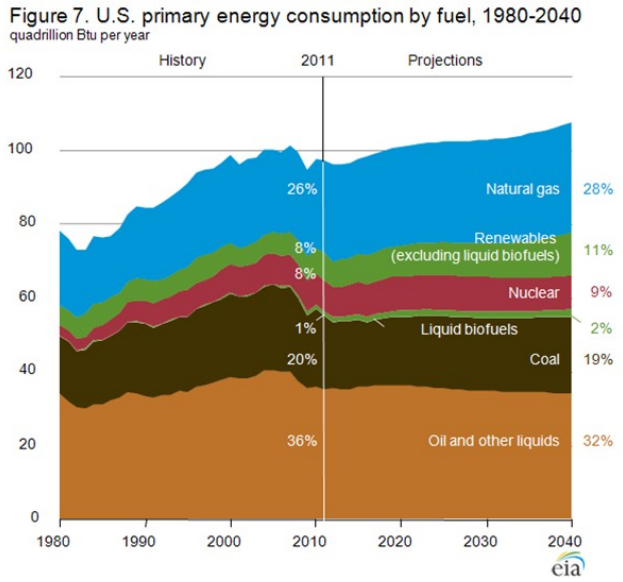
Four projects in Wisconsin were explored to convert existing coal or natural gas power plants to either biofuels or co-fired plants. The current energy costs put all four projects on hold pending a change in the cost of natural gas. The current low natural gas prices are projected to increase which could provide a financial incentive for utilities to pursue additional biomass conversions to meet the federal and state renewable energy requirements.

Power Generation Fuel Costs (Energy Information Administration)[3]

	2009	2010	2011	2012	2013	2014
Coal	2.21	2.27	2.39	2.40	2.36	2.40
Natural Gas	4.73	5.09	4.73	3.39	4.49	4.64

[1] State of Michigan, http://www.michigan.gov/energy
[2] Biomass Thermal Energy Council website, http://www.biomassthermal.org/legislative/CWEP.asp
[3] Energy Information Administration, retrieved 2013.07.22, from XXXXXXX

The Energy Information Administration predicts an increase in biomass conversions, projected at a 7% growth rate through 2040[4]



Current Supply

Currently the biomass used in the Western Upper Peninsula is a combination of residue from other lumber operations or clearing and chipping of lower value woody feedstocks. Smaller biomass systems use the byproduct of value-add processing such as hardwood lumber and flooring companies.

Concurrently with this project, WUPPDR also investigated the development of a wood pellet plant to be located in Ontonagon, Michigan. This report was also trying to understand the available supply of wood and woody biomass within the Western UP and northern counties of Wisconsin. (A single dry ton is equivalent to 2 green tons.)

[4] Energy Information Administration, http://www.eia.gov/forecasts/aeo/topic_efficiency_all.cfm

Table 4.1: Green Tons of Logging Residue Generated by Industrial [5] Roundwood Harvesting on All Ownerships[1] (2011) - Counties of Interest

	Michigan	Wisconsin	Total
National Forest	54,302.90	2,292.31	56,595.22
National Park Service	-	-	-
Dept. of Defense	-	-	-
Other Federal	-	-	-
State	85,704.82	47,044.25	132,749.06
County, municipal, etc.	15,195.38	21,978.96	37,174.34
Other non federal	-	-	-
Private	529,529.71	144,524.88	674,054.59
Total	**684,732.82**	**215,840.40**	**900,573.2**

Data extrapolated from U.S. Department of Agriculture, Forest Service, North Central Research Station. Forest Inventory and Analysis National Program. 2011.

Based on this data there is large available supply of woody biomass, but the major issue for users of biomass is getting it economically and of reasonable quantity. The logging that is producing the residue is focused on the high value logs, not the residue. The collection and transportation of residue from the woods has proven to be economically difficult. The residue also potentially has quality issues related to foreign material being present (rocks, sand, dirt, needles). A plantation planted hybrid poplar stand allows the user to get high quality woody biomass at an economically feasible price.

Future Supply

The impact of renewable energy mandates and incentives will be one of the largest drivers behind a change in demand for woody biomass. The current Renewable Energy Mandate has tended towards wind and solar, but recent trends are seeing a resurgence in biomass as a renewable resource. Limitations with production using solar and wind (no sun or wind means no power) are motivating energy producers to examine biomass as a consistent alternative.[6]

Based on Dr. Froese's study there is estimated to be 56,000 acres of retired agricultural lands within 60 miles of Ontonagon and at the low end of productivity at 3 dry tons per year, could generate 168,000 dry tons per year of woody biomass.[7] This availability of a previously unused resource could provide additional income, jobs and electrical stability to the Western UP of Michigan.

[5] Porcupine Pellet Plant Business Plan, Renewable Resource Solutions, LLC
[6] Dominion completes biomass conversion of Altavista plant, Biomass Magazine
[7] "Energy Crop Opportunities in the Western Upper Peninsula of Michigan, Robert Froese, Zane Abbott, 2012

Biomass

Biofuels is a general term for converting biological mass into energy; this can be liquid fuels, processed pellets or combustion of chipped material. In this report we are focused on the production of woody biomass using a managed, dedicated energy crop. Woody biomass can also be obtained from existing forestlands and is currently how the majority of the demand is being met locally.

In the Upper Peninsula (U.P.) alone there are more than 8 million acres of forestland. Yet only about 1/3 of the productive capacity is harvested every year, the remainder accumulating in the forest.[8] This would indicate there is available biomass; the issue is obtaining this biomass efficiently and economically. With such low harvest rates and the geographic distribution of these harvests, obtaining a consistent supply of woody biomass might be problematic in the future.

Managed woody biomass can produce 8 times as much biomass on a yearly basis as native forests and is easier to harvest. The woody biomass is planted in plantations with consistent spacing which enables easier harvesting. Potentially in the future, dedicated equipment will simplify the conversion of the woody biomass directly into chipped material. This plantation planting also reduces contamination of the fuel by reducing non-vegetative material in the shipments.

The changes in the renewable energy mandates are putting additional emphasis on "closed-loop" biomass production.[9] This "closed-loop" system starts with dedicated woody biomass plantations that are planted and managed strictly for biomass energy production.

Woody Biomass

The Energy Crop Opportunities report investigated three different biomass crops to determine which would be economically feasible to plant on unused agricultural lands in the Western Upper Peninsula. The report recommended that hybrid poplar would be the most economically feasible and will be used in this report as the biomass of choice. Below is a summary of the three biomass crops investigated in the report.

Willow

- Initial planting costs make this type of crop too expensive to establish
- Planting 6,000 cuttings per acre

[8] "Energy Crop Opportunities in the Western Upper Peninsula of Michigan, Robert Froese, Zane Abbott, 2012
[9] "Biomass: Comparison of Definitions in Legislation Through the 112th Congress", Kelsi Bracmort, http://www.fas.org/sgp/crs/misc/R40529.pdf

- Requires specialized equipment to feasibly do larger plantings
- 3 year harvest cycles provides earlier revenue, but does not have a positive payback

Hybrid Poplar

- Long harvest cycle (10 years)makes it a long-term investment
- Positive returns at a yield of greater than 3.3 dry tons/acre/year
- Initial planting costs require large upfront investment
- Availability of planting technology could be an issue

Switchgrass

- Cheaper to establish using traditional farm planting methods
- Harvest on a yearly basis
- No current market exists due to the technical issues with use as a biofuel
- Harvest occurs at the same time of year resulting in a glut in the market or the need to store and manage a harvested crop

Landowner Feasibility

In order to create a cooperative it is important to understand if there is a market for the products and services it could provide. Since the user of the products and services will be the landowners, one needs to understand the financial feasibility of planting and harvesting hybrid poplar. It is assumed in this section that the landowner is using unused farmland which will make the establishment of the hybrid poplar easier.

Expenses

In order to establish a planting of hybrid poplars the landowner will incur costs associated with the establishment and maintenance of the crop. Initially, the land will need to be prepped by clearing any existing trees, shrubs and larger vegetation. The land will then need to be plowed and herbicide applied to kill and control weeds. The cuttings will need to be planted either manually or using tree planting equipment. For larger plantings automated planting equipment will be required as the manual process will take too long. Advances are being made in the development of specific planting equipment that will lower the costs, but they are not currently on the market.

After initial establishment the landowner will need to apply herbicide again at the beginning of the second year to continue to control weeds and other native grasses. After the third year an application of fertilizer will occur. The final expense will come at the end of the growing cycle in year 10, when the trees will be harvested.

Revenues

The revenue for the biomass is realized at the end of the ten year growing cycle. This long-term return has been an issue for many of the landowners that have had their land assessed.

Financial Model[10]

	Year										
Per acre	0	1	2	3	4	5	6	7	8	9	10
Machine and Planting											
Planting	$121										
Herbicide	$10	$10									
Site Prep	$25										
Fertilizer				$50							
Harvest											$385
Subtotal	$156	$10	$0	$50	$0	$0	$0	$0	$0	$0	$385
Material and Supplies											
Seedlings	$145.20										
Herbicide	$10	$15									
Fertilizer				$10							
Subtotal	$155.20	$15.00	$0.00	$10.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total	$311.20	$25.00	$0.00	$60.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$385.00
Revenue		$0	$0	$0	$0	$0	$0	$0	$0	$0	$900

Assumptions

The landowner financial model uses the same base assumptions as presented in Dr. Froese's paper and are included below. This model is also available as an Excel spreadsheet and was submitted with this report.

Assumptions:	
Discount Rate	5%
Planting (cuttings/acre)	1210
Cost per seedling	$0.12
Yield (dry tons/acre/year)	3.0
Farmgate price (dry ton)	$30
Years to harvest	10
Planting cost per seedling	$0.10
Harvest cost per acre	$385.00

[10] "Energy Crop Opportunities in the Western Upper Peninsula of Michigan, Robert Froese, Zane Abbott, 2012

Sensitivity

Costs of initial planting and maintenance are the biggest concern of landowners. If the cooperative could reduce the costs, landowners could have a better return. The table below looks at the sensitivity to an increase in yield and reduction in costs. The numbers in the table represent the value of the overall investment if it was converted to an annuity with the 5% discount rate applied. Current research has shown that the yields of hybrid poplars should be in the range of 3.75 dry tons per acre per year.[11]

	Annualized Payments over a 10 year period per acre										
	Dry tons per acre per year										
	3	3.2	3.4	3.6	3.8	4	4.2	4.4	4.6	4.8	5
Base case	($9.15)	($4.38)	$0.39	$5.16	$9.93	$14.70	$19.47	$24.24	$29.01	$33.78	$38.55
10% cost reduction	($1.41)	$3.36	$8.13	$12.91	$17.68	$22.45	$27.22	$31.99	$36.76	$41.53	$46.30
20% cost reduction	$6.34	$11.11	$15.88	$20.65	$25.42	$30.19	$34.96	$39.73	$44.50	$49.27	$54.04

Cooperative Strategy

Through landowner surveys and site visits done in the summer of 2012, it was clear that the landowners would be interested in forming and joining a cooperative if it primarily reduced the expenses of planting and maintaining woody biomass plantings. Some landowners already have the necessary equipment for site preparation and maintenance, but others will need to procure those services through the cooperative, hopefully utilizing those members who already have the necessary equipment.

Cooperative Basics

Basic definition: *A member-owned and member-controlled business that operates for the mutual benefit of all members*. Cooperatives are formed by a group of individuals that are motivated by a shared need for products or services. The Midwest and Michigan have a long history of agricultural cooperatives focused on shared resources such as processing and distribution. There has been some recent history of wood based cooperatives in the Midwest, see the following section for an analysis of lessons learned from those cooperatives.

[11] "Growth and Yield of Poplar and Willow Hybrids In the Central Upper Peninsula of Michigan", Miller, Bender, Michigan State University

Benefits

A cooperative is member owned and governed by its members through a Board of Directors. The Board governs the cooperative to maximize the benefit of the members, not shareholders. The shared aspect of the cooperative allows the members to leverage a small amount of individual capital to enable an organization that can provide services beyond the scope of an individual. The shared governance model also ensures stability as long as the cooperative provides goods and services that are in demand to their members and non-members.

Member-owners receive patronage refunds based on the profitability of the cooperative and their share of use of the cooperative during a fiscal year. If the cooperative is profitable, it must distribute those earnings to the member-owners based on the member-owners spending with the cooperative.

	Cooperative	Typical Corporation
Owners	Members	Shareholder
Business Purpose	Meet member needs, member return	Owner return on investment
Financed	Common share, preferred stock, retained earnings	Sale of stock, retained earnings
Profits	Members, in proportion of use	Stockholders in proportion of investment

Lessons Learned from Wood Based Cooperatives[12]

E.G. Nadeau from Cooperative Development Services reviewed 14 forest-owner organizations and 7 agricultural cooperatives from 1998-2012 in the upper Midwest. The following is a summary of his findings.

In order for a cooperative to be successful:

- Need favorable public policy
- Incentives like Wisconsin's Managed Forest Law
- Consistent Co-op and member-owner goals
- Market exists for products or services

Specific to a wood based cooperative:

- Enough landowners willing to pay for services to reach economic scale
- A system for equipment sharing and joint marketing of products

Future Opportunities:

- Biomass aggregation and marketing

[12] "Forest Owner Cooperation in the Upper Midwest Overview and Lessons Learned, 1998-2012", E.G. Nadeau, Cooperative Development Services. Funded by the University of Wisconsin Center for Cooperatives

Successful New Cooperatives:[13]

- Use committees, advisers and outside expertise effectively.
- Keep members informed so that they stay involved and supportive.
- Conduct businesslike meetings by using agendas, parliamentary procedures and democratic decision-making.
- Maintain good board-management relations by clearly defining roles and responsibilities.
- Follow sound accounting practices, and present financial reports regularly.
- Develop alliances with other cooperatives.
- Develop clear policies on confidentiality and conflict of interest.

Potential Risks to a New Cooperative[14]

- Lack of a clearly defined mission, purpose and focus.
- Lack of member leadership.
- Inadequate feasibility study and/or business plan.
- Failure to use experienced advisors and consultants.
- Lack of financial commitment from members.
- Lack of competent management to run the cooperative's operations.
- Failure to identify and minimize business risks.
- Lack of adequate financing.
- Inadequate communications.

Cooperative Mission

The initial proposed cooperative strategy will focus on shared services and purchasing to enable planting of woody biomass and reduce the initial investment of the landowner. The cooperative would serve as a conduit that connects the landowner with individuals to provide the necessary services related to land preparation and planting. This will leverage the member-owners that have agricultural equipment and expertise, providing a benefit to both individuals. The cooperative will hopefully be able to reduce costs by purchasing items in bulk quantities for member-owner use.

The keys to successfully establishing a woody biomass cooperative:

- Avoid heavy capital investment in equipment
- Leverage owners equipment and expertise
- Explore establishing a revolving loan fund (based on availability of capital)
- Avoid reliance on government funding for ongoing operation (self-sustainable)
- Generate local expertise in growing woody biomass
- Educate landowners about the benefits of woody biomass

[13] University of Wisconsin Center for Cooperatives, http://www.uwcc.wisc.edu/howtostart/Factors/
[14] University of Wisconsin Center for Cooperatives, http://www.uwcc.wisc.edu/howtostart/Factors/

Products and Services Offered

In order to enable the establishment of the cooperative and its on-going sustainability, the cooperative will focus on securing products and services for its members through contracting services and bulk purchasing. From the lessons learned, the cooperative will focus on contracting services rather than employing a large internal staff.

Land assessment – Similar to the services provided by the summer intern in 2012, the cooperative will contract with an experienced forestry student or forester to assess the feasibility of member-owners property for the establishment of hybrid poplar.

Land preparation for planting – Working with the member-owners that have the necessary equipment, the cooperative will acquire the necessary skills and equipment to prepare the land for planting.

Planting – Hybrid poplar cuttings can be manually or mechanically planted. The cooperative would coordinate the ordering of cuttings, contracting the necessary labor and equipment and coordinating with the landowner. A longer term strategy might be to invest in specific planting equipment dedicated to planting cuttings.

Bulk purchasing (seedlings, herbicide, fertilizer) – One of the advantages that can occur with a cooperative is to get bulk pricing on commodities that can be retailed to member-owners to create a revenue stream. This might require leasing storage and handling inventory, but in the initial stages it can be planned to meet only current demand.

Maintenance – The plantings will need to be maintained with herbicide application and fertilizer. These services will be coordinated by the cooperative.

Harvesting – Ultimately the trees will be harvested for sale, the cooperative will coordinate the proper services on behalf of the landowner.

Marketing and Selling – The cooperative will serve as a broker to assure that the demand is there for biomass at the time of harvest. This can be advantageous to the member-owner because they will make sure there isn't a glut of supply. It will also be beneficial to the end consumer of the biomass because it will provide a central point of contact to procure raw materials.

Financing – Initially there is no clear funding model to provide upfront financing to member-owners, but research will be done to determine if a Revolving Loan Fund could be established that would minimize the up-front expenses to the member-owner.

Cooperative Financial Scenarios

Assumptions and Variables

In order to determine the market size of the cooperative's products and services, the overall number of potential members is determined. The original research identified 1,250 landowners as potential member-owners by identifying idle farm land of more than 20 acres within 60 miles of Ontonagon, Michigan. This number is the potential, but based on the attendance at previous presentations (75 to 100 landowners) the growth of the cooperative should be expected to be slow and measured. The model assumes that there will be 20 new member-owners planting property each year.

The second variable in the model is how many acres will be planted and therefore, later harvested. The list of the potential landowners and those who requested a land assessment was used to determine an average planting size of 25 acres per landowner. Those acres planted then would be assumed to have the same cash flows required per acre as discussed in the landowner financial analysis.

In order for member-owners to establish their hybrid poplar, they will need to potentially engage the cooperative for some or all of their services. For the initial evaluation, it is assumed that all necessary expenses will be contracted through the cooperative. As the strategy is refined, a better split of usage of the cooperative versus landowners doing it themselves can be determined.

Since the cooperative must make money to fund operations, there will be a difference between the cost of a service or product to the cooperative and a cost of a service or product to the member-owner. This gross margin will enable the cooperative to pay part-time employees to manage the business and build expertise in the community. A typical small profitable agricultural cooperative has a profit margin of 11%. In this model it is assumed the margin of 10% for services and 15% for products. The expenses and revenues that a landowner would incur from Dr. Froese's model are used as a starting point and then assumed that the cooperative could achieve the 10 and 15% profit margin through negotiation and bulk purchasing.

The cooperative would generate $20,650 in the first year towards the fixed costs, that amount would increase to $25,525 in year 3 and $44,750 in year 10 when harvesting begins. See the appendix for the complete financial model.

Strategy Wildcards

The following "wildcards" are items that could potentially impact the strategy of the cooperative but are currently not considered in the strategy document outlined above. These items will be impacted by changes in legislation, government funding, and interest in forming a cooperative.

Investing in planting and harvesting equipment

The lessons learned clearly caution against investing heavily in capital equipment before establishing sufficient markets to support the cost of financing, maintaining, and replacing the equipment. One of the key enabling pieces of equipment would be initially investing in planting equipment and in 10 years, harvesting equipment.

An off-the-shelf tree/cabbage planter could reduce the planting cost per tree from $0.10 to $0.09 each and enable planting of 3.5 acres per day versus manually planting at a rate of 1 acre per day (depending on how many individuals are contracted.) Tree planters can be found on many used farm equipment websites and typically run from $2,000 to $10,000 each and would require a tractor and operator to physically plant the trees.

Injection planter developed by Energy Performance Systems[15]

[15] Energy Performance Systems website

The recent development of a specialized injection planter by Energy Performance Systems[16] could potentially reduce the cost to $0.03 per tree, at a rate of 95 acres per day. The system was developed with funding from Excel energy[17] before the drop in natural gas prices and is yet to be made commercially. This system could also reduce the amount of site prep that is required since it can inject trees in untilled soil.

Harvesting is traditionally done using existing tree harvesting equipment in conjunction with chipping of the biomass for easier transport. Since the trees are planted closely together in rows, Energy Performance Systems also developed a tree harvesting system that is specifically targeted at biomass plantations. The Whole Tree Harvester™ was developed by Energy Performance Systems under the same project that developed the injection planter. The Whole Tree Harvester™ travels up to 6 miles per hour through a harvest area and increases productivity with harvest rates of 200 to 1,000 green tons per hour depending on the diameter size of the biomass crop.[18] This technology is yet to be commercialized and sold as a stand-alone piece of equipment but might be advantageous should a critical mass of plantations are planted in the Western UP.

Whole Tree Harvester™ in action[19]

[16] Energy Performance Systems website
[17] Improving the Efficiency of Planting, Tending, and Harvesting Farm-Grown Trees for Energy, Excel Energy
[18] Improving the Efficiency of Planting, Tending, and Harvesting Farm-Grown Trees for Energy, Excel Energy
[19] Improving the Efficiency of Planting, Tending, and Harvesting Farm-Grown Trees for Energy, Excel Energy

Revolving Loan Fund

In 1998 a group of Minnesota farmers formed the Minnesota Agroforestry Cooperative to educate farmers about planting hybrid poplars for pulp production. Recognizing the high upfront cost of establishment, they created a Producer Capitalization Fund that would cover the initial and maintenance costs and potentially provide annual payments in anticipation of the harvest. At harvest the money would go back into the fund to finance other plantings. The cooperative was unable to get enough funding to make the Fund viable and became inactive in 2012.

This model could be attempted to assist member-owners in the initial establishment and provide a yearly cash flow to offset the hesitancy associated with the long-term return. Getting sufficient funding would be difficult in the current economic environment.

Possible External Funding Sources

The cooperative strategy discussed in this document assumes that the cooperative is funded only through the operations of the cooperative and the initial purchase of a common share. There are possibly other state or federal funding sources that should be explored. Many of these funding sources may not be funded in future years; follow the hyperlinks to determine current funding status.

Rural Development Funding for Cooperatives[20]

- Advanced Biofuel Payment Program
    - The Advanced Biofuel Payment Program provides payments to producers to support and expand production of advanced biofuels refined from sources other than corn kernel starch. The program supports and helps to ensure the expanding production of advanced biofuels by providing payments to eligible advanced biofuel producers. Eligible applicants include cooperatives.
- Business And Industry Guaranteed Loans (B&I)
    - The Business and Industry Guaranteed Loan program provides loan guarantees to improve, develop, or finance business, industry, and employment and improve the economic and environmental climate in rural communities. The B & I program can also be used for guaranteed loans to cooperative members for cooperative equity stock purchases.
- Intermediary Relending Program (IRP)
    - The Intermediary Relending program provides loans to local organizations, including cooperatives, to establish revolving loan funds. These revolving loan funds are used to finance ultimate recipients to alleviate poverty and increase

[20] USDA website, http://www.rurdev.usda.gov/BCP_FundingForCoops.html

economic activity and employment in rural communities. Applicants must be experienced in making and servicing revolving loans. Cooperatives are also eligible ultimate recipients.

The following opportunities are not directly related to the operation of the cooperative, but could improve the biomass infrastructure or demand.

USDA FS FPL Woody Biomass Utilization Grant

Oriented toward funding engineering services on woody biomass projects using existing biomass.

Community Wood Energy Program

Funding of publicly owned and operated woody biomass systems

Forest Biomass for Energy Program

The Forest Biomass for Energy program is a research and development program to encourage use of forest biomass for energy. The Forest Service, other federal agencies, state and local governments, Indian tribes, land-grant colleges and universities, and private entities are eligible to compete for program funds.

Rural Energy Self-Sufficiency Initiative

The Rural Energy Self-Sufficiency Initiative assists rural communities with community-wide energy systems that reduce conventional energy use and increase the use of energy from renewable sources. Grants are available to assess energy use in a rural community, evaluate ideas for reducing energy use, and develop and install integrated renewable energy systems.

Rural Energy for America Program (REAP)

REAP provides financial assistance for: grants, guaranteed loans, and combined grants and guaranteed loans for the development and construction of renewable energy systems and for energy efficiency improvement projects (eligible entities include rural small businesses and agricultural producers). REAP provides grants, loans, and loan guarantees to support rural renewable energy (bioenergy, hydrogen, solar, wind, hydropower) and energy efficiency projects

Next Steps

1. **Form a Steering Committee**
   A small group of interested landowners, community stakeholders and governmental resources will be formed. This group will further develop the strategy and work to educate and engage other stakeholders in the possible cooperative.
2. **Engage with USDA Rural Development**
   USDA Rural Development has many programs oriented toward supporting the development of cooperatives. They can be a source of expertise, funding and support.
3. **Determine feasibility**[21]
   The steering committee will refine this strategy document to suit the needs of potential member-owners. A feasibility study based on the steps outlined in the USDA Guide to Starting a Cooperative will be used to determine if this is the proper time to proceed to a full business plan.
4. **Contract with Cooperative Development Services or other professional consultant to finalize the business plan**
   One of the primary success factors in the creation of any business is the development of an accurate, realistic business plan. Unless the steering committee has this expertise, contracting a professional who has worked with cooperatives previously will be very beneficial. The business plan will provide the cooperative member's a specific plan on how the cooperative will be formed and operate. It also might inform the steering committee that it is not feasible at that point, but the document will provide a starting point should the environment change later.
5. **Engage and recruit potential member-owners**
   If the business plan is compelling, the cooperative steering committee with need to actively recruit and educate potential member-owners.
6. **Incorporate the cooperative**
   Once the cooperative is considered economically feasible, a legal firm will need to contacted to develop the legal and governance documentation.

[21] "Vital Steps, A Cooperative Feasibility Guide", USDA Rural Development, http://www.rurdev.usda.gov/rbs/pub/sr58.pdf

Appendices

Links and Resources

Whole tree harvester, developed specifically to harvest plantation planted hybrid poplars - http://www.energyperformancesystems.com/Energy_Performance_Systems/Whole_Tree_Harvester.html

Center for Cooperatives, University of Wisconsin – An excellent source for all issue related to cooperatives. http://www.uwcc.wisc.edu/

Cooperative Development Services – Consulting firm focused on cooperatives. www.cds.coop

Biomass Magazine – A general resource for news and events related to biomass and biofuels. http://biomassmagazine.com/

Heating the Midwest with renewable biomass – Area specific news and information concerning biomass energy. http://heatingthemidwest.org/

USDA Rural Development – Funding programs and cooperative assistance. http://www.rurdev.usda.gov/BCP_FundingForCoops.html

Center for Cooperative Forest Enterprises – Association of forest oriented cooperatives. http://www.nnfp.org/CCFE/

Ontario Biomass Producers Cooperative Inc. – Example of current biomass cooperative. http://www.ontariobiomassproducersgroup.wildapricot.org/

Show Me Energy Cooperative – The first biomass energy cooperative. http://www.showmeenergycoop.com/

Basic Financial Projections for the Cooperative

Acres added	500	500	500	500	500	500	500	500	500	500	500
Year	0	1	2	3	4	5	6	7	8	9	10
Revenue											
Services											
Site Prep	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500
Planting	72,600	72,600	72,600	72,600	72,600	72,600	72,600	72,600	72,600	72,600	72,600
Maintenance	5,000	10,000	10,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000
Harvest											192,500
Products											
Herbicide	5,000	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500
Seedlings	72,600	72,600	72,600	72,600	72,600	72,600	72,600	72,600	72,600	72,600	72,600
Fertilizer				5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Total Revenue	167,700	180,200	180,200	210,200	210,200	210,200	210,200	210,200	210,200	210,200	402,700
Variable Expenses											
Contract services											
Site Prep	11,250	11,250	11,250	11,250	11,250	11,250	11,250	11,250	11,250	11,250	11,250
Planting	65,340	65,340	65,340	65,340	65,340	65,340	65,340	65,340	65,340	65,340	65,340
Maintenance	4,500	9,000	9,000	31,500	31,500	31,500	31,500	31,500	31,500	31,500	31,500
Harvest	-	-	-	-	-	-	-	-	-	-	173,250
COGS											
Herbicide	4,250	10,625	10,625	10,625	10,625	10,625	10,625	10,625	10,625	10,625	10,625
Seedlings	61,710	61,710	61,710	61,710	61,710	61,710	61,710	61,710	61,710	61,710	61,710
Fertilizer	-	-	-	4,250	4,250	4,250	4,250	4,250	4,250	4,250	4,250
Total Variable expense	147,050	157,925	157,925	184,675	184,675	184,675	184,675	184,675	184,675	184,675	357,925
Gross Revenue	20,650	22,275	22,275	25,525	25,525	25,525	25,525	25,525	25,525	25,525	44,775