

A Market-Based Approach to Community Wood Energy: An Opportunity for Consulting Foresters

by Robert T. Perschel





Cover photo credits: forest, log truck, and chips by Caitlin Cusack, boiler by David Brynn, and forest at upper right by Zander Evans.

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The Forest Guild practices and promotes ecologically, economically, and socially responsible forestry—"excellent forestry"—as a means of sustaining the integrity of forest ecosystems and the human communities dependent upon them.

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INTRODUCTION

From 2007 to 2008, the Forest Guild and its partners¹ conducted two Community Wood Energy pilot projects—one in Bristol, Vermont, and the other in the Mahoosuc region of Maine. Our goal was twofold: (1) to evaluate the potential for rural forest-based communities to save money by using wood energy to heat schools or municipal buildings, and (2) to explore the possibilities of obtaining fuel supplies that are Sustainable, Efficient, Local, and Fair (SELF).² Caitlin Cusack, a summer 2007 intern in Bristol from the Yale School of Forestry and Environmental Studies, produced a community resource guide, *Harnessing the Power of Local Wood Energy: Ensuring a Sustainable Supply of Woodchips for Your School*.³ Forest Guild member Harry Dwyer of Ghost Dancer Forestry is completing an evaluation of the potential to install a wood energy heating system in the Mahoosuc region of Maine and to supply it with SELF fuel. He has interviewed landowners, town officials, foresters, loggers, and sawmill owners, and has determined that there is community support, an available wood supply, adequate logging and forestry infrastructure, and a great deal of enthusiasm for a project that could serve local energy needs while providing new markets for local forest-oriented businesses.

The interim results of these projects revealed the potential for using consulting foresters as key players in the expansion of community wood energy projects in New England and beyond. In addition, increased fuel prices, along with state, regional, and national policies to mitigate climate change, are creating an increased use of woody biomass. Furthermore, provisions in the 2008 Farm Bill offer possibilities for support of community wood energy efforts.

To explore the role of consultant foresters further, the Forest Guild conducted a May 2008 “charrette” at the Vermont Family Forest headquarters in Bristol.⁴ A charrette is a collaborative session in which a group of experts meet to draft a solution to a design problem. Often used in the architectural field, it proved useful here in helping us think about the opportunities, obstacles, and advantages of utilizing consulting foresters in community wood energy projects. This report uses the input from that meeting as well as what we learned in our two pilot projects to present a market-based approach to community wood energy projects. It specifically suggests that the business model for small consultant foresters can be profitably applied to serve community interests while increasing revenue, profitability, and visibility.

¹ Partners included Vermont Family Forests, Northern Forest Alliance, Biomass Energy Resource Center, RJ Turner Co., and the Vermont Department of Forests, Parks, and Recreation.

² See Appendix for a definition of SELF wood chips.

³ Cusack, Caitlin. 2008. *Harnessing the Power of Local Wood Energy: Ensuring a Sustainable Supply of Woodchips for Your School*. www.forestguild.org/publications/research/2008/Local_Wood_Energy.pdf

⁴ Forest Guild members attending were Ehrhard Frost, Robert Turner, Adam Sherman, David Brynn, Bob Perschel and Erin Quigley.

IT'S OUR WOOD, LOCAL AND GOOD: EIGHT BENEFITS OF COMMUNITY WOOD ENERGY PROJECTS

Implementing community-based wood energy projects that utilize SELF woody biomass has the potential to provide a number of benefits critical to the long-term health and vitality of rural communities and the forest. A recent report by the Carsey Institute at the University of New Hampshire lists four tenets of successful rural economic development:⁵

- Innovation is key to driving growth and prosperity in today's global economy.
- Significant capital investments are required to put innovations to use.
- Development efforts must seek to protect valuable natural assets.
- Development is a "contact sport," best pursued through dense networks of personal contacts.

Each of these tenets is fulfilled to some extent by community wood energy projects. The following eight benefits specific to these programs include the use of innovative technologies for wood burners and silviculture, significant capital investments in heating systems, the protection of the natural forest landscapes, and a focus on building dense networks of personal contacts.

1. Increase rural community competitiveness

Rural communities face increasingly greater challenges to their local economies, long-term vitality, and ability to preserve a cherished way of life for residents. Locally produced goods face greater competition in the global marketplace. Rural communities are often lacking in transportation and communication infrastructure. Quality educational opportunities are difficult to provide, and "brain drain" siphons off skilled workers and creative entrepreneurs. Capital is scarce and cost of goods may be high. Energy is another factor that can make running a home or business in a rural community an expensive undertaking. In order to compete as a good place to live and run a business, rural communities require a reasonably priced and secure source of energy. Community energy derived from local woody biomass is much less expensive than fossil fuels and not subject to the insecurities of the global supply network.

2. Enhance community networks and connections to neighbors and the environment

Even residents of rural communities face increasing alienation as modern society offers less opportunity to engage socially with neighbors. Civic engagement on issues critical to community well-being—historically supported by the New England town meeting—is also eroding.^{6,7} More workers tend to find employment outside the local economy. The historical connections to land attenuate as fewer jobs are forest based. Children—in rural

⁵ Brown-Graham, Anita, and William Lambe. 2008. *Measures and Methods: Four Tenets for Rural Economic Development in the New Economy*. Carsey Institute. Policy Brief No. 9

⁶ Belkin, Douglas. 2004. Town Meetings Seen in Decline: Some Communities Try Creative Efforts to Sustain a Threatened Tradition. *May 9, 2004, Boston Globe*.

⁷ Zimmerman, Joseph Francis. 1999. *New England Town Meeting: Democracy in Action*. Praeger, Westport, CT.

as well as suburban and urban areas, spend less time in the natural world.⁸ New ways to reinforce community-based social and economic connections are needed. Community wood energy projects include local citizens in the supply chain from forest to end user. Landowners, foresters, loggers, truckers, mill owners, local officials, and students all interact and work together to supply inexpensive energy.

3. Reduce the cost of energy and increase the local economic multiplier effect

The cost of energy can be a competitive advantage or disadvantage for forest-based communities. Many homes and municipal buildings in New England are heated with oil, and the bitter winters and recent price swings for heating oil make energy a greater factor than in other parts of the country. Oil is expensive, and the dollars paid for it flow out of the community. Alternatively, woody biomass from local forests offers a considerable cost savings. In the 2007–2008 heating season, Vermont schools using the latest generation of wood-heat systems saved roughly half of what it would have cost to heat with oil, about \$77,500 per school.⁹

Our analysis indicates that SELF woodchips can be delivered for \$80 per ton. This would be equivalent to oil at \$1.60 per gallon, as compared with oil prices that have peaked close to \$5.00 per gallon in 2008. Energy dollars would be spent and circulated in the community, supporting local workers and businesses, instead of flowing out of the community and overseas. The advantages of this approach to the fabric of rural community life are many. In addition to promoting healthy local forests for forest products, beautiful scenery, recreation settings, and water quality, the dollars spent on energy stay in the local area, passing from municipality to logger, landowner, and forester, and then back into the village stores and businesses. One conservative estimate of the power of the multiplier effect is that when money stays in the community, every \$10 respent locally is worth up to \$25 to that community.

4. Educate and influence family forest landowners to practice excellent forestry¹⁰

The majority of forest land is owned by private landowners, and many of them are family forest landowners who own parcels ranging from 10 to 1,000 acres. The number of family forest owners in the conterminous United States increased from 9.3 million in 1993 to 10.3 million in 2003. These owners now control 42 percent of the nation's forestland. Half of the family forest owners have harvested trees, but they have been extraordinarily difficult to reach and educate about excellent forestry. After decades of programs designed to influence these owners, most have not utilized a forester and only 3

⁸ Louv, Richard. 2005. *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*. Algonquin Books, Chapel Hill, NC.

⁹ Bodin, Madeline. Reading, Writing and Renewables: Vermont Schools Lead the Way on Alternative Energy. *May 25, 2008, Rutland Herald/Times Argus*.

¹⁰ **Excellent forestry** goes beyond meeting minimum best management practices and places the long-term viability of the forest above all other considerations. Some management approaches focus on aspects of excellent forestry without neglecting that larger whole. For instance, **ecological forestry** is the set of practices that emphasizes the maintenance or enhancement of the full suite of ecological values, while still allowing for human use. **Community forestry** focuses on the human systems that depend on forests while utilizing forestry practices that are ecologically sound. Thus, ecological forestry and community forestry are two related pathways to and components of excellent forestry. Simply put,

Ecological Forestry + Community Forestry = Excellent Forestry.

percent of them have a written forest-management plan.¹¹ While these figures are likely higher for the northeastern U.S., the number of landowners with management plans or the advice of a forester typically ranges only from 15 to 25 percent. For most owners, word of mouth is still the main way they get information on how to manage their forest and about who can provide them with the services to manage it well.¹² Community wood energy projects bring local consulting foresters into a partnership with forest landowners to supply community energy needs. This arrangement offers a continuous connection to landowners cemented by the community service aspect of community wood energy projects (e.g., helping to heat municipal buildings, practicing sustainable stewardship, etc.) that will tend to be operative at the point in the family lifecycle when critical decisions are made on forest management.

Clearly, our previous approaches to bringing excellent forestry to family forest landowners have met with limited success. It's time to try something new.

5. Provide new markets to support the practice of excellent forestry

As members of the Forest Guild, our goal is to practice and promote ecologically, economically, and socially responsible forestry—"excellent forestry"—as a means of sustaining the integrity of forest ecosystems and the human communities dependent upon them.

One of the keys to practicing excellent forestry is the availability of markets for lower-grade material. Low-grade markets allow foresters to implement silvicultural practices that yield quality products and ecosystem services over the long term. When low-grade markets are not available, the pressure increases to do more high grading and liquidation cutting, which eliminates the prospects for many future value streams. The growing markets for biomass can provide these important low-grade markets and allow responsible foresters and landowners to practice excellent forestry.

6. Promote local forestry consulting businesses

There are hundreds of consulting foresters in the Northeast states operating successful but challenging businesses that provide services to private landowners. These mostly one- or two-person operations are locally based in the region's towns and villages. Their business clientele are the same landowners who could potentially serve as suppliers of wood fuel for local schools and municipal buildings. Long-standing business relationships with a network of landowners are critical to successful consulting businesses, and foresters spend a good deal of time locating and cultivating this client base. Community wood energy projects offer a natural focal point to establish, nurture, and expand a local client network.

¹¹ Butler, Brett J., and Earl C. Leatherberry. 2004. America's Family Forest Owners. *Journal of Forestry* 102(7):4-9.

¹² Judith Langer. 2008. *Family Forest Owners: Insights into Land-Related Stewardship, Values, and Intentions*. GfK Roper Public Affairs and Media. www.sustainingfamilyforests.org/pdfs/Focus_Group_Report.pdf

7. Reduce cost of energy and travel time for consultants and associated service providers

Having local networks of landowners providing woody biomass in close proximity to the end user reduces travel costs for the particular project and in the aggregate can reduce the cost of energy for the region. We all know it shouldn't make economic sense to ship wood fuel to Europe, but how many times has the oil truck pulling into the local high school passed the log truck exiting a local woodlot and heading to a far-off destination? Up to now these economic decisions have been distorted by the low cost of subsidized oil, but now that it can cost over a dollar a mile in fuel to run a log truck, these kinds of decisions will be weighed differently. The shorter haul distances from local woodlot to local high school boiler will have significant competitive advantages.

8. Lessen the boom-and-bust market cycles that plague the forestry sector

Markets for wood pulp and, to a lesser extent, saw timber fluctuate widely. This makes it difficult to time harvests appropriately and increases the risk of large investment in logging and transportation equipment. These regional market trends are exacerbated and become more unpredictable in an integrated global market. Establishing a significant local market for woody biomass as a primary heating source will help stabilize markets and tend to dampen the peaks and valleys of market cycles.

A MARKET-BASED MODEL AND THE ROLE OF CONSULTING FORESTERS

Each of the above benefits can be realized through a market-based model that centers on local consulting foresters. In this model, foresters join forces with a number of partners to make the entire community wood energy project a reality. Partners would include local advocates in town governance or other parties interested in using woody biomass for heat, as well as organizations that can provide technical assistance. The report on the Bristol project provides an excellent overview of these partnership possibilities and of how to initiate community based projects that supply local wood fiber to heat municipal buildings.¹³ The consulting forester's primary roles in this new model include community education and organizing, excellent management of local woodlots, and securing a reliable supply of SELF woodchips.

This approach would require a modification in the business plans of many consultants and might also require that the consultant obtain new skills or strengthen existing ones. The new business model would also establish a healthy roster of client landowners by building a local network of family forest owners willing to supply SELF chips. The consultant would continue to work with clients outside this local network, but the local network could potentially become a major portion of the client base necessary to support a consulting business. Conversely, the consulting forester's existing client base could comprise the core of an effective local network.

Landowners own land for emotional reasons, and this network taps into those connections.¹⁴ These projects are win-win-win-win propositions: The school or municipal

¹³ Cusack 2008

¹⁴ Langer 2008

building gets less expensive energy; the landowner gets a reliable market for low-grade material and excellent forestry; the community benefits from local dollars remaining in the economy, enhanced community connections, and a sense of place; and the consulting forester gets a local client base and the chance to practice excellent forestry. Landowners will be excited about making a profitable and honorable connection between their woodlot and the community school. This approach makes them part of a local network of sustainably managed forests that would help keep the school kids warm in the winter while reducing the annual school budget.

The consulting foresters and project partners could borrow a page from the Northern Forest Alliance's Vermont Town Forest Project playbook by ensuring that these connections are celebrated each year in a ceremony at the school.¹⁵ Landowners, students, teachers, parents, loggers, foresters, truckers, and mill owners could celebrate the town's energy independence and their own energy interdependence. Participating landowners would be recognized and perhaps a plaque with their names could be hung in a prominent location. A map of the participating forest parcels might be another visual aid posted in the Town Hall and other public locations. This distinction and word of mouth will help engage more landowners in practicing sustainable forestry and raise the visibility of the consulting forester.

In addition to supporting the supply of local energy, each well-managed property would also yield traditional wood products such as wood pulp and saw timber, as well as providing wildlife habitat and recreational settings. These kinds of networks also make it easier to manage wildlife habitat across many parcels and facilitate the establishment of joint recreational uses such as hiking, biking, skiing, and snowmobiling.

In summary, this project has the potential to reach and educate family forest landowners in a new, more effective way. Though they may have demonstrated some success while the outreach effort was funded and operating, previous efforts tended to be intense but short-term. Landowners make key decisions to harvest on unpredictable schedules that are tied to the unique situations evolving within the family such as illness, education needs, land turnover, marriage breakups, financial crises, etc. Reaching and educating a landowner with a forestry message this year may have very little effect on their decisions when the critical stages in family history are reached years later. But a community wood energy program establishes a continuous effort that is market-based and independent of outreach or public relations funding subsidies for long-term execution. An ongoing program to heat a school year after year can become a community tradition which raises the visibility of the local expert forester and tends to operate by word of mouth through peers and neighbors. This communication strategy has proven to be the most effective way to ensure innovative techniques are adopted.¹⁶

¹⁵ Daley, Jad, editor. 2008. *The Vermont Town Forest Stewardship Guide: A Community User's Manual for Town Forests*. The Northern Forest Alliance. Montpelier, VT.

¹⁶ Gross, Ryan B. 1943. The Diffusion of Hybrid Corn in Two Iowa Communities. *Rural Sociology* 8:15–24.

Landmark studies of the introduction of hybrid corn revealed that farmers tended to resist adoption of superior technologies until they saw their neighbors implement them and were encouraged through word of mouth to follow.¹⁷ Adoption of any new innovation in a population is based on a bell curve. First to accept are the innovators (2.5 percent), then early adopters (13.5 percent), early majority (34 percent), late majority (34 percent) and laggards (16 percent).¹⁸ Once the early stages are completed, the acceptance and implementation explodes until most of the population is utilizing the new innovation. If we consider excellent forestry to be in the early stages of adoption, then we can see that encouraging community wood energy projects can help us bring on more of the innovators and early adopters and establish the communication network that will expand the innovation to the rest of the population.

However, the initiation of this program may require an up-front investment to augment the business models and skills of consulting foresters. Strong community organizing and communication skills are examples of training that some consulting foresters might need to invest in as they relate to this new model. In addition, financial support through the start-up phase of the network development is necessary. Therefore, the initial phase of each community wood energy initiative will require funding from outside sources to assist the consulting foresters in organizing the community, interfacing with the technical wood energy experts, and building the landowner network. However, once the initial start-up phase is over, the wood energy unit is installed, and the landowner network is established, oversight of the project becomes a part of the ongoing business plan of each local consulting forester and no further outside funding is anticipated. At this point, the model becomes a market-driven profitable venture and the consultant is paid through his or her normal payment arrangement with landowners.

Alternative approaches are possible. The community could run the wood energy project and hire the consultant, or the consultant could form a new formal cooperative of landowners and work for them. Several consultants may team up or share the provision of services. Though care must be taken to avoid conflicts of interest by ensuring consulting foresters are working for only one entity and that their contractual relationships are transparent, several business approaches can yield the same results. Whichever path is chosen, the goal must be for the project to become self-sufficient, a part of the financial incentives to private consultants inherent in normal market-based transactions. This approach eliminates the need for ongoing subsidies and ensures the continuity required for expanding long-term forest management for family forest owners.

¹⁷ Griliches, Zvi. 1960. Hybrid Corn and the Markets of Innovation. *Science*, July 29.

¹⁸ Rogers, E. M. *Diffusion of Innovations*, 5th ed. Free Press, New York, NY.

OBSTACLES TO COMMUNITY WOOD ENERGY DEVELOPMENT

For the community wood energy model to succeed through a market-based approach involving consulting foresters, the following obstacles should be considered and, if present, addressed:

1. The least expensive woodchips available come from non-sustainable sources such as land-clearing operations, mill residues and unsustainable harvests. The price of SELF woodchips will be higher because the additional costs of sustainable forest management and careful logging must be covered. However, as the use of woody biomass increases it is expected that the demand will outrun the supply from land clearing and mill residues and result in a new pricing structure for chips originating from forest management. As communities are forced to diversify their sources of wood fuel supplies in tighter markets, SELF chips should become more competitive, even as they remain the more expensive option. It will be important that SELF woodchip proponents make a convincing argument that the benefits of using SELF woodchips within the community wood energy approach outweigh the additional costs.
2. Community wood energy projects require an expanded set of skills that are not always a part of typical forestry training programs. Consulting foresters may need additional training in community organizing, partnership building, and leadership skills, as well as the fundamentals of network creation, such as collecting and organizing computer databases, media cultivation, and the development of effective landowner communication tools.
3. Community wood energy projects require a long-term community commitment and buy-in at every part of the product chain, from woods to boiler. Current business arrangements and/or community dynamics may not be supportive of the change in energy sourcing. The needs of all stakeholders must be addressed.
4. Consulting foresters will require initial financial support to augment business models, invest in community organizing skills, and spend the required time to work with partners, build community support, and the new landowner network.
5. Guidelines for SELF chips will have to be developed and adopted at the local level, or through certification programs adapted to the scale of specific community networks. Performance will have to be measurable and verifiable at a reasonable cost.
6. Consultants must be careful to avoid conflicts of interest in new business relationships. It needs be clear who the consultant represents.

CONCLUSION

Community wood energy projects using consulting foresters can serve the interests of the community, forest landowners, consultants, and the forestry sector in general. The Forest Guild will continue to develop this program concept through our pilot projects in Bristol, Vermont, and the Mahoosuc region of Maine. We will seek to further develop partnerships with organizations or individuals well-suited to participation in this project. The Forest Guild will also pursue funding to help expand the concept of community wood energy across the region and to support consultant foresters in the formative stages. Please be in touch if you have feedback on this project, would like more information or would like to investigate how to develop a wood energy project in your community.

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I also would like to thank our partners in the Guild's Community Wood Energy Project. Our work in community wood energy was an outgrowth of the exciting Vermont Town Forest Project coordinated by the Northern Forest Alliance and we wish to thank George Gay and Jad Daley for their support and guidance. In our Bristol, Vermont project we were hosted and supported by Vermont Family Forests. The Biomass Energy Research Center provided technical expertise and strategic perspective on the potential of woody biomass for community energy. The Guild looks forward to working with these partners in expanding the role of foresters in securing sustainably produced woody biomass for rural communities.

Thanks also to Forest Guild staff members Howard Gross, Marcia Summers and Alexander Evans who all provided insight and editing expertise to the final product.

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APPENDIX

A Definition of SELF Woodchips

The concept of a SELF (Sustainable, Efficient, Local and Fair) woodchips originated with Forest Guild Member David Brynn and his work with Vermont Family Forests. The following explanation of the four broad components of SELF is an excerpt from David's writings on this topic for the Vermont Eco-Wood Energy Project:¹⁹

1. Sustainable production of wood fuel will focus first on maintaining forest health and second on forest use. A core principle is the recognition that “Without a healthy forest ecology there cannot be a healthy forest economy or community.” Addressing the elements of sustainability outlined in the Montreal Process, we will use the Vermont Family Forest checklist as the foundation for our approach to forest conservation and management. This checklist has been referred to as the gold standard for certification and it has been independently approved by the Forest Stewardship Council. When fully implemented, the checklist has been shown to be very effective in maintaining and/or enhancing water quality, soil productivity, native biological diversity, carbon storage, and forest resistance to invasion exotics. Sustainable production requires that forest stewards be adequately compensated so they can afford to practice excellent forestry. An essential part of our approach to the forest is that forest stewards—including landowners and the loggers who work for them—be empowered in the marketplace. Excellence in the forest must be recognized in the forest product marketplace. In addition, we must rapidly update our technology, moving from skidders to forwarders in the forest and from eyeballs to lasers at the sawmill. Finally, sustainable production requires sensitive metrics to evaluate impacts, including real-time carbon budgets.

2. Efficient use recognizes that wood—though renewable—is also limited. Vermont's forests per capita annual gross production is currently less than 4 cords. This wood must be used well. We need to squeeze out the maximum amount of service and work from every wood-based BTU. This requires, for example, that buildings be evaluated for efficiency and substantially upgraded as needed to maximize energy conservation.

3. Local sourcing reduces transportation costs. Perhaps more importantly, it provides the opportunity for clear and short feedback loops that allow customers to witness and feel the impacts of their decisions. Local sourcing also allows for rapid change and adaptive management.

4. Fair access is an essential element in our approach. For example, access to an affordable source of dry firewood can be the difference between life and death for the elderly, the poor, and the less fortunate. When supplies of energy are limited, allocation of energy resources must be fair.

¹⁹ Brynn, David. *In press*. The Vermont Eco-Wood Energy Project: A Community Based Initiative Integrating Sustainable Production, Efficient Use, and Equitable Access in Local Wood Energy Systems as a Response to the Challenges Posed by Climate Change and Peak Oil. Vermont Family Forests. Bristol, VT. (“Eco-Wood Energy” is a trademark of the UVM Rubenstein School's Green Forestry Education Initiative and Vermont Family Forests).