

Conventional Wisdoms of Woody Biomass Utilization

There are a number of challenges the biomass utilization which varies from region to region, nationwide or statewide. The lack of biomass processing capacity may impede progress in one area while another has an inconsistent supply for the wood products markets. Woody biomass utilization in Colorado, and other states, must address the uncertainty surrounding the effectiveness of public and private entities to build sustainable partnerships focusing on biomass removal from forested lands.

The purpose of this study was to:

1. Examine all aspects of biomass utilization strategies already developed in regions with varied resources and wildfire risks.
2. Identify the types of utilization activities, focusing on agency, industry and community factors that contributed to the projects accomplishment
3. To identify key challenges to biomass utilization faced by each project and the strategies used to overcome them
4. Assess the roles of collaborative partnerships in hazardous fuel reduction planning, implementation and capacity building for biomass utilization

Northern Colorado Front Range, Southwest Colorado & New Mexico

Three case studies were analyzed:

1. Larimer and Boulder counties, the Arapaho-Roosevelt National Forest, Boulder Parks and Open Space, Denver Water and various municipalities (including Fort Collins, Boulder, Loveland and Longmont); it illustrates the complexity of increasing biomass utilization within the wildland-urban interface.
2. Southwest Colorado involving the San Juan Public Lands, which is home to the Southern Ute tribe and the communities of Durango, Cortez, Dolores and Pagosa Springs.
3. Lincoln National Forest, Mescalero Apache Tribe and the Village of Ruidoso have forged a partnership focusing on the utilization of woody biomass to increase fuels reduction and offer quality job opportunities.

Examples of Biomass Utilization

The scope of biomass utilization along the Front Range is limited; some businesses exist though on a small scale. The focus is on local markets for animal bedding, post and pole, compost and firewood. The Boulder Parks and Open Space building is 95,000 square feet and heated with wood chips. To heat this building requires 600 – 700 tons of dirty chips (~30 truck loads a year or 30,000 acres of treated forests); the installation cost was \$260,000.

In contrast with the Front Range the Southwest focused on utilization of firewood and nontraditional markets. The expansion of low-value markets for firewood represents one of the few areas where biomass utilization has been ongoing and consistent. By exploring nontraditional markets businesses, like Excelsior (in business since 1940), can remain competitive and productive.

The village of Ruidoso in southern New Mexico has created an ordinance that assesses a property tax and fees on water bills for excessive hazardous fuels and encourages thinning forests and underbrush. The

revenue generated is used to pay for the pickup and removal of the biomass and pays a local contractor to utilize the material (incentive for the contractor to expand and invest in itself). Projects are also in place in the Lincoln Nation Forest and the Capitan District which are focused on reducing wildfire risk and providing technical assistance to landowners with wildland fire suppression responsibilities.

Challenges of Biomass Utilization in Colorado

Lack of Infrastructure

The lost of Northern Colorado's forest products infrastructure has meant that biomass utilization has to be built from the ground up. The only remaining mill in southern Colorado is in Montrose, Colorado more than 100 miles to the North, of the San Juan Public lands, over many mountain passes.

"You need three things... You need to have a product of value, you need to have a road infrastructure to get that product of value out of the woods, and then you need to have some nucleus of an industry there to build on in the first place. And when you look at the Front Range here, as I've mentioned before, we don't have a very valuable product... we don't have a very good road infrastructure... I don't think we have a nucleus of an industry yet. (Northern Colorado Front Range #18)

"You don't have a healthy market until you have producers and users occupying all the various product niches. You don't have a healthy market by just having a few of the folks that are the bottom-feeders that use the low value [material]. (Northern Colorado Front Range #27)

Biophysical Constraints

Much of the Front Range and Southwest Colorado is dominated by dry environmental conditions with poor soil. Because of decades of fire suppression the Ponderosa pine forests is dominated by small diameter trees with a high juvenile:mature wood ratio. The implication of this change in physical characteristic is that the quality of wood is poor and only suitable for a smaller range of forest products than historical ponderosa pine.

"One of my good logger friends always jokes. He says, "By gosh, the wood in the Front Range might not be very tall and it might not be very big, but by God it sure is limby." You know, it's a quality issue... And so, by definition though, we're typically cutting the smaller trees and removing the ladder fuels. Those sorts of things, those products that don't have a lot of intrinsic value to them." (Northern Colorado Front Range #20)

Physical Access/Remoteness

Only a fraction of high risk acres could realistically be treated given steep slopes, sensitive areas or because of the great number of private landowners this area encompasses. The magnitude of private in-holdings on the Arapahoe National Forest makes project planning and road access difficult.

In Southwest Colorado, the area does not have an expansive interstate or railroad system and the closest urban center is Albuquerque, NM (~4 hr drive).

"They want to build biomass plants and they want to build pellet plants. But we brought a fellow out on a "show-me" trip last summer, and he just said basically, "Your road system is awful. Your ground is steep, your ground is rocky, your road system is awful. You've got plenty of material; yes I see it. But how can I get it? I

can do it, but it's going to cost you, you're going to mortgage the farm here.” (Northern Colorado Front Range #19)

High Costs

Because there is a lack in a forest products infrastructure the haul distance from forest to mills has greatly increased leading to high transportation costs; even with increased utilization private landowners may still have to pay to get the material removed from their lands.

“Utilization is costing us anywhere from \$900 to \$1,200 [an acre], and that cost, I don't see that changing much because it's the access, it's the transportation, and it's the fact that that biomass doesn't have very much value in the market right now.” (Southern New Mexico #35)

Consistency of Supply

Consistency of supply of woody biomass from federal lands was a barrier to the investment in the Boulder Parks Open Space wood chip heating facility. Stewardship contracts have yet to make an impact in providing a more consistent supply.

“They will never bring any infrastructure back to the Southwest until they can have a reliable supply and some guarantees. Because to bring somebody in who is going to invest \$6 - \$10 million to build a plant, they're not going to be able to get the financing and if they don't need the financing and have the capability to do it themselves, they're not going to invest their money when they don't have a sustainable supply.” (Southern New Mexico #33)

State Policy

Multiple state incentive programs are underway including Colorado's Renewable Portfolio Standard; however this standard does not yet included wood biomass as a qualifying feedstock.

Saturated Markets

The market is flooded with material from the Mountain Pine Beetle outbreak in Canada. Saturated markets coupled with high transportation costs and even sawlogs have little value.

Challenges of Biomass Utilization in Southern New Mexico

Severe fire risks, physical constraints and mixed ownership

Crossing private land to access project sites has been a challenge resulting in material being left on site, steep slopes also contribute to un-utilized material.

Mill Closures

“We don't have a good infrastructure here. . . Usually in large saw mill settings, you have all these little satellite businesses that kind of feed off of byproducts of the mill and take parts of the process that the mill doesn't actually use, and we don't have that real nice web of businesses around here.” (Southern New Mexico #32)

Determining Treatment Priorities

Balancing high fire risk areas needing treatment with available funding is a challenge and requires out-year planning and multiple funding sources.

"[The agency] says they have budget restraints like that there, but when there's a forest fire, it seems like they're going to spend that money there. They won't spend it on the front end, they're always spending it, it's like they're in crisis mode on everything they do around the country." (Southern New Mexico #33)

New Approaches for Biomass Utilization

New strategies to gain access and reduce transportation costs are needed to increase woody biomass utilization as well as identifying local markets for the material. This can be done through programs like the Colorado Forest Products program through the Utilization and Marketing Department of the Colorado State Forest Service. Other approaches underway are the development of stewardship contracts and wood collection sites to help provide a consistent supply of woody biomass in the Front Range.

Collaborative efforts between private and public entities in Southwest Colorado are determining the feasibility of a small-scale energy facility; the discussions between these groups are addressing some of the obstacles present. Business recruitment and retention is key for identifying and accessing new markets for wood products ranging from Ponderosa pine to Pinyon-Juniper.

The Mescalero Apache Tribe in Southern New Mexico has completed a number of feasibility studies to assess biomass to energy technologies and are exploring ways to keep a sawmill open, reopen another sawmill and create long-term living wage jobs. The village of Ruidoso is persisting to keep fire risk down and supporting local businesses.

Keys to Successful Biomass Utilization

Collaboration

The efforts of collaborations are believed to be essential to establishing long-range utilization enterprises. Combining private capital with agency grants and efforts will be critical to the development of infrastructure.

"If you want biomass to try to stand on its own, it won't happen. They can't pay enough for biomass for the cost that it would take to remove it. And so what it's gonna take here? It's gonna take a commitment to manage a certain part of the land that not only produces biomass, but if there's a couple diameter post and poles or sawlogs, those need to go to an area that generates more revenue than it took to get it out to help offset the cost of the biomass removal." (Northern Colorado Front Range #27)

"Well, one thing is the Forest Service can't do it alone. I was talking about that before; we just don't have the expertise. So you need to get the state folks involved. You need to get the county folks involved. You know, it has to be a partnership with a lot of things happening. And you need to get the industry folks involved, so that, you know it's a joint effort in making it happen." (Northern Colorado Front Range #18)

"Nobody's really sure of the current technology, so there's a knowledge gap. And then it's an up-front investment that people may not be comfortable with. This particular office is only a year and a half old, and it was scheduled to have a cogeneration plant to utilize biomass for its heating systems. And it went to the Washington office to be designed. And it did not receive any support for that cogeneration. So basically we had engineers design a new building without taking our input as to what we wanted to do, being a leader in the community. And engineers couldn't get over the fact that this was somewhat new technology and unconventional way of heating...now we're getting a couple solar panels and a little wind generator to make

things right. I mean, it's sad, it's very sad. I mean, it's government, and we as an agency should lead the way. But our own people and processes get in the way.” (Southwest Colorado #108)

Small-Scale facilities

Success has been with small-scale rather than large scale and is more likely to be effective in the short and medium term given supplies, transportation issues and markets.

“Everybody wants to see bio-oil and electric power there, and that obviously costs millions of dollars for those two types of facilities. What I'm trying to do is, I'm trying to get them to think a little bit smaller scale and build up to that. And, you know, let's figure out a way to start utilizing small diameter stuff and then we can look at, as we build capacity up there, get to the point where they can start putting plants and do bio-oil and electricity and the whole nine yards there. So, they have identified the problem, they want to get rid of material, but they're going with something that's going to take ten years and \$80 million to do to where they could start tomorrow with something very simple.” (Southern New Mexico #41)

“So we did a bunch of research...[and] came to the conclusion that most people have, which is that forest product biomass is primarily useful for thermal, not for electricity. And so we've been working at the county level. I've made independent, individual lists for all ten counties and said, “Got any public buildings that you're about to put on-line?” Consider this.” (Northern Colorado Front Range #22)

“We generally support community-based projects and we're talking about typically facility-heating projects that run in the range of 500 to 1,000 ton supply requirements annually. That seems to be a scale that can work well, and they can draw their material from a variety of sources. They can set up collection sites and have private landowners bring their material to them.” (Northern Colorado Front Range #28)

Local Support/Building Social Capacity

Local support may lead to the expansion or creation of markets suited to the material available in the area which will also lead to a reduction in wildfire risk. The focus on local businesses creating products for local markets is appealing to most. There is also a need for agencies and partnerships to continue to share their experiences in identifying opportunities and creatively developing strategies for further resource utilization.

Flexibility

There is a sense that with continued effort and flexibility the right mix would be found and allow for different activities and possibilities.

“I've definitely realized that 2 X 4 sawmills are not the future, that we need to diversify and try to produce a number of products, and wherever we can encourage industries to do that, it's in our best interest and the local economy's best interest.” (Southern New Mexico #40)

Persistence

Being persistent and keeping the conversation open allows for the exploration of possibilities and identification of new means of overcoming obstacles to woody biomass utilization.