



Colorado-Wyoming Society of American Foresters Position Paper

Promoting Utilization of Forest Biomass to Restore Forest Health and to Meet the Energy Needs of the Colorado-Wyoming Region

Mike Eckhoff

Graduate Research Assistant
Department of Forest, Rangeland,
and Watershed Stewardship
Colorado State University
Phone: (970) 491-6874
E-mail: mike.eckhoff@colostate.edu

Dr. Kurt H. Mackes

Associate Professor
Department of Forest, Rangeland,
and Watershed Stewardship
Colorado State University
Phone: (970) 491-4066
E-mail: kmackes@cnr.colostate.edu

Position

The Colorado-Wyoming Society of American Foresters (CO-WY SAF) supports policies that promote the utilization of forest biomass¹ in the region. Forest biomass provides a unique opportunity to simultaneously address two sets of intense, seemingly relentless threats facing our region:

1. deteriorating forest health conditions with increased risk of wildfires, and
2. increasing energy costs for transportation, electric power, and heat.

Concerning the first set, forest biomass utilization can help address the current forest health crises plaguing western forests by providing a marketable outlet for removed material that would otherwise contribute to the severity of catastrophic wildland fire events. Our forests provide

¹ Defined, forest biomass consists of any “non-merchantable materials or pre-commercial thinnings that are byproducts of preventative treatments, such as trees, wood, brush, thinnings, chips, and slash, that are removed to reduce hazardous fuels, to reduce or contain disease or insect infestations, or to restore forest health” (Society of American Foresters 2005).

watershed quality protection, wildlife habitat, forest products, and recreational opportunities. To ensure that our forests continue to provide these benefits for future generations, efforts must be made to improve forest health by reducing fuel loads, managing for insect and disease outbreaks, and reducing the cost of those efforts incurred by taxpayers. Restoring forest health quickly is in the best interests of our region.

Concerning the second set, retail energy prices have increased dramatically since 2000. Substantial portions of the region's population are living with scarce resources. Rising prices with severely strained resources forces us to decide between necessities and to look for alternatives to traditional fossil fuel sources. Forest biomass can provide such an alternative renewable energy source for meeting our transportation, electric power, and heating needs, although some uses at the present may be more suitable than others.

More specifically, the CO-WY SAF will aggressively support the conversion of propane and coal-burning buildings to operations that involve burning wood in order to meet heating needs. The CO-WY SAF will also aggressively support the development of cellulosic ethanol in an effort to address the looming liquid transportation fuels crisis. These efforts, however, will not be possible without a diversified wood products industry to help defray costs for infrastructure development, transportation, and implementation.

A number of barriers exist to utilizing forest biomass and developing a diversified wood products industry. Efforts must be made to help Coloradoans make the connection between forest conditions and the long-term prognosis for forest health. Funding is needed to help offset costs and decrease risks assumed by those attempting to develop or operate biomass-related businesses and contracts. Infrastructure is needed to match supply with demand. Finally, policy incentives must be brought into alignment to create an equitable platform for forest biomass utilization.

The CO-WY SAF supports policies that encourage the development of economically-sound and environmentally-responsible forest biomass acquisition, production, and utilization, especially in parts of the region where the needs and opportunities are the greatest and costs incurred to implement are the lowest. These policies must ensure that adequate considerations are made to safeguard air, water, and soil quality in addition to exercising caution with regards to wildlife habitat integrity and minimizing recreation interruptions. In addition, the CO-WY SAF supports efforts to level the playing field among all alternative renewable energy options.

Issue

Forest health conditions are reaching critical mass for both public and private forestlands. In a recent news release, the death of all mature lodgepole pine forests in Colorado will occur during the next 3 to 5 years (Pankratz 2008). Similarly, between 85% and 90% of all mature lodgepole pine forests in southern Wyoming will also die (Pankratz 2008). These stands are impacted primarily by the mountain pine beetle (*Dendroctonus ponderosae Hopkins*) but these beetles have the potential to spread to other species, such as ponderosa pine forests along the Colorado Front Range and eastern Wyoming. Other threats to forest health exist, including other bark beetles, dwarf mistletoe, and widespread aspen die-offs.

In addition to forest health issues, energy issues are also gaining attention. Retail prices for gasoline have doubled since 2000 and prices for natural gas fluctuated wildly during the same time period, at times representing a 100% increase in price (US EIA 2007a, 2007b). Spiking energy price increases impact families in the region with particular severity. To illustrate, one out of every five families in Colorado lives below the self-sufficiency standard as calculated by the Colorado Fiscal Policy Institute (CFPI 2007). These families must choose how to allocate scarce funds among necessities i.e. choosing between heating and eating.

Using forest biomass can address both of these problems *simultaneously*. The use of forest biomass is beneficial for a number of reasons:

- Biomass, including forest biomass, is currently the only renewable source that can be converted into liquid form. Cellulosic ethanol from forest biomass can be used in the same ways that other types of ethanol are currently used today (e.g. E85 stations, etc).
- Forest biomass is not an intermittent source, meaning that one doesn't have to wait for the sun to come out or for the wind to start blowing. Forest biomass makes an excellent complement to these other renewable alternative energy sources.
- Due to the dense, overstocked stands, forest biomass is widely available and can be readily accessed.
- According to prices compiled weekly by the Pellet Fuels Institute (2008), forest biomass can be cheaper than other energy sources.
- According to the California Public Utilities Commission (2007), forest biomass is greenhouse gas *negative*, meaning that utilizing forest biomass can help mitigate the greenhouse effect. Burning forest biomass transforms methane that would be released from decomposition into carbon dioxide released during combustion. Methane is 20 to 25 times more potent a greenhouse gas than the carbon dioxide.
- Finally, given the nature of forests in Colorado and Wyoming, it's the only renewable energy source that can hurt us when we do not use it. The materials that burned during the historic 2002 wildfire season in Colorado (e.g. Hayman, Missionary Ridge, etc.) were primarily small-diameter material e.g. forest biomass.

Background

Colorado contains approximately 22 million acres of forestland,² covering approximately one-third of the state. Most of these lands (72%) are publicly-held; the remainder is owned by non-industrial private forestland owners (Smith, et al. 2004: 32). From a survey conducted by the Colorado State Forest Service (2002), roughly 6.3 million of these acres or about 25% of Colorado's forested lands are in the wildland-urban interface (WUI) or "red zone," with one-third in close proximity to the Interstate 25 corridor. Acres in the red zone are at high-risk for catastrophic wildland fire events. Colorado reduces forest fuel loads on an average of just 40,000 acres a year.

Wyoming contains approximately 11 million acres of forestland (approximately 18% of the state's total area) with the largest concentration in the northern half of the state (Koch, et al.

² Forestland is defined as "land at least 10 percent stocked by forest trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated" (Smith et al. 2004: 12).

2001: 17; Wyoming State Forestry Division 2007: 37; Smith et al. 2004: 32). Like Colorado, the majority of these lands (~83%) is publicly-owned and managed almost entirely by the federal government; the rest are privately-owned. Pressures on Wyoming's forests from human encroachment continue to increase as people continue to move chiefly to counties containing or adjoining National Forests or forests found in National Parks (Koch, et al. 2001: 34-35).

Partially to reduce the risk to these increasing human populations, forest management policies have been geared largely toward fire suppression. The result: fuel loads in the form of sub-merchantable, small-diameter material, which should be periodically eliminated through naturally-occurring wildland fires, are accruing throughout the region. As the trees were allowed to grow unchecked, they formed dense, overstocked stands subject to stress. These stands are more likely to suffer insect and disease outbreaks and pose a greater risk for wildfires.

Methods to reduce these loads are plentiful; economically-viable methods are not. The accrued material is expensive to remove and often the value of the material is not nearly enough to pay for its own removal. Funds that have been allocated to treating acres tend to be used for less-costly approaches to treatment e.g. mastication or "lop-and-scatter" approaches where trees are chipped and then scattered on the forest floor. The net result is that the loads are not reduced but simply changed in form from on-the-stump to on-the-ground (Lynch and Mackes 2003). Although some of this floor material may be considered vital for nutrient cycling, some of the material may be considered surplus and thus available for removal and utilization.

Recently, wildland fire events have come to the region's and the nation's attention. In 2002, for instance, Colorado sustained its worst fire event in recorded history with the Hayman fire. By the time the blaze was extinguished, it had scorched over 136,000 acres with at a cost of over \$40 million for suppression alone. Recent estimates suggest the total cost of the Hayman fire exceeds \$200 million and continued to grow in terms of millions of dollars per year (Lynch 2004). These costs result from continued efforts to promote land rehabilitation, damages sustained from increased flooding, and monetary losses due to decreasing property tax revenues.

Compounding the fire danger is the threat to the region's economic prosperity. Colorado relies primarily on tourism revenues. Beetle outbreaks in the state have caused large swaths of lodgepole pine forests to turn "red" as the trees slowly die. These trees can provide suitable material for catastrophic wildland fire events. The footprint left on Colorado forests at the end of the 2002 wildfire season was slightly more than 500,000 acres with estimated lost tourism revenues at over \$2 billion (Benson 2002). The footprint for the current mountain pine beetle outbreak in Colorado is three times as large (Pankratz 2008)—and it continues to grow.

Although efforts to promote forest biomass utilization can be traced back to at least 1974, more recent initiatives have supplied greater momentum. For instance, the Healthy Forest Restoration Act of 2003 authorized grant monies for increased and improved research and development activities. The Energy Policy Act of 2005 included a number of financial tools, regulatory standards, and grant programs to encourage forest biomass utilization. The more recent Energy Independence and Security Act of 2007 increased the mandated cellulosic ethanol targets but also placed additional restrictions from where raw materials could be obtained i.e. forest biomass from federal forest lands could not be used to produce cellulosic ethanol in order to meet those legislated targets.

Colorado has also made efforts to promote forest biomass utilization. With the Forest Ag program, applicants must produce a product for profit to partially fulfill program requirements. More forcefully, the state was the first in the nation to pass a renewable portfolio standard (RPS) via citizen ballot initiative. An RPS requires utilities to produce a certain percentage of their electricity using renewable energy sources. For Colorado, major utilities must produce 20% of their power using renewable sources by 2020.

However, significant barriers to forest biomass utilization persist in the Colorado-Wyoming region. These barriers can be grouped into four distinct yet interrelated categories:

1. **Education:** Citizens of the region are still not making the connection between forest conditions and the long-term prognosis for forest health, although the recent media focus is helping educate citizens in the region. Even if the connection is made, citizens may be left wondering what they can do to help.
2. **Funding:** Funding to help offset costs and decrease risks assumed by those attempting to develop or operate biomass-related businesses and contracts is lacking i.e. funding is authorized but not appropriated or, if appropriated, funding levels are not adequate. For instance, the Healthy Forests Restoration Act of 2003's biomass provisions authorized funding for biomass grants but these funds were never appropriated.
3. **Infrastructure:** The supply of woody biomass in Colorado is abundant but tends to be located far from existing facilities and markets and as a result is expensive to acquire, transport, and utilize. At the same time, demand is increasing as the region's human population increases (US Census Bureau 2007). The infrastructure needed to match the forest biomass supply with demand for the material is missing.
4. **Policies:** Current policy incentives are misaligned. For instance, air quality regulations do not take into account the net reduction in pollutants associated with forest biomass utilization. Title V permits must be amended to allow the burning of wood; this process can be expensive and serves inadvertently as a cost-deterrent for utilities seeking to use cleaner-burning fuels. Also, the federal production tax credit (PTC) for forest biomass is half of what solar, wind, and geothermal are allowed. Colorado's renewable portfolio standard (RPS) does not include "trees" in the definition of biomass nor does it provide the same set-aside provision for biomass as it does for solar installations. Finally, the definition of "renewable biomass" in the latest federal legislation excludes federal forest lands as potential sources for the production of liquid biofuels from meeting provisions in the renewable fuels standard (RFS).

Increasing forest biomass utilization can aid land owners and land managers in their efforts to restore forest health. Material removed from these efforts can be used to help diversify our region's energy diet by creating new markets for alternative renewable energy sources for transportation, power, and heat.

References

- Benson, M. 2002. Fires, drought contribute to \$1.7B tourism hit. Coloradoan Newspaper. Fort Collins, CO.
- California Public Utilities Commission. 2007. Interim opinion on Phase 1 Issues: Greenhouse gas emissions performance standard. Available online at: http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/64072.pdf.
- Colorado Fiscal Policy Institute (CFPI). 2007. Overlooked and undercounted: Struggling to make ends meet in Colorado. Available online at http://www.cclponline.org/ccs/documents/CCLPBooklet_FINAL.pdf; last accessed 28 Jan 2008.
- Koch, L., P. Rogers, M. Frank, D. Atkins, and L. Spiegel. 2001. *Wyoming forest health report: A baseline assesment, 1995-1998*. Available online at <http://slf-web.state.wy.us/forestry/adobe/wyfhm.pdf>; last accessed 18 Jun 2008.
- Lynch, D. 2004. What do forest fires really cost? *Journal of Forestry* 102(6): 42-49.
- Pankratz, H. 2008. Beetle scourge goes from bad to worse. *Denver Post*. Available online at http://www.denverpost.com/search/ci_7972146; last accessed 10 Feb 2008.
- Pellet Fuels Institute. 2008. Compare fuel costs. Available online at: <http://www.pelletheat.org/3/residential/compareFuel.cfm>.
- Smith, W.B., P.D. Miles, J.S. Vissage, and S.A. Pugh. 2004. Forest resources of the United States, 2002. General Technical Report NC-241. St. Paul, MN: U.S. Dept. of Agriculture, Forest Service, North Central Research Station. 137 p.
- Society of American Foresters (SAF). 2005. Utilization of forest biomass to restore forest health and improve US energy security. Available online at http://www.safnet.org/policyandpress/psst/Biomass_Utilization_Position_10-19-05.pdf; last accessed 28 Jan 2008.
- US Census Bureau. 2007. Colorado quickfacts. Available online at <http://quickfacts.census.gov/qfd/states/08000.html>; last accessed 15 July 2007.
- US Energy Information Administration. 2007a. U.S. natural gas prices. Available online at http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_dcu_nus_m.htm; last accessed 16 July 2007.
- 2007b. U.S. retail gasoline historical prices. Available online at http://www.eia.doe.gov/oil_gas/petroleum/data_publications/wrgp/mogas_history.html; last accessed 16 July 2007.
- Wyoming State Forestry Division. 2007. *Wyoming biomass inventory: Animal waste, crop residue, wood residue, and municipal solid waste*. Office of State Lands and Investments. Available online at <http://slf-web.state.wy.us/forestry/adobe/biomass.pdf>; last accessed 18 Jun 2008.