



# Burning Wood for Energy

## Back to the Future Solution for Modern Problems

by

Jay O'Laughlin, University of Idaho

and

Lucy Dukes, *Coeur d'Alene Press*

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Using woody biomass to create energy is a "triple win," says the Society of American Foresters — restoring forest health, providing renewable energy alternatives, and revitalizing rural economies.

"And that's not all," says Jay O'Laughlin, professor of forest resources at the University of Idaho and director of the College of Natural Resources Policy Analysis Group. "Forests play a huge role in climate change mitigation. The carbon cycle has been altered by the burning of fossil fuels for energy. As a result there is more carbon stored in the atmosphere than ever before. It would be silly to design a machine to remove carbon dioxide (CO<sub>2</sub>) from the atmosphere when trees do the job so efficiently, and for free. The only practical way to reduce atmospheric carbon is to allow trees to do their thing — absorb CO<sub>2</sub>, store the carbon as wood, and release the oxygen," says O'Laughlin.

Biomass, in the renewable energy context, refers to living or recently dead biological materials that can be used as fuel or for industrial production. Wood burning currently accounts for almost two percent of all the energy consumed in the U.S., and more in states like Idaho with abundant forest resources.

Residues from the manufacture of lumber, wood products, and paper are burned as a fuel

for cogeneration of steam heat and electricity in the industrial sector, or directly for power generation in the electricity sector. Biomass is used for space heating in residential and commercial buildings. For example, the University of Idaho saves Idaho taxpayers upwards of two million dollars per year by heating the campus with steam produced by burning wood residues from local sawmills instead of natural gas.

Not only can woody biomass be used for energy, it causes problems when not used. Much of Idaho's forested land — which covers forty percent of the state — is already overcrowded with excessive fuel, to the point where tree mortality is at the highest level since measurements began 57 years ago.

"The annual growth added by the billions of trees in Idaho's forests totals to a mind-boggling one billion cubic feet of wood per year.

That's enough biomass to cover a football field with a stack of wood four miles high. One fourth of that is removed to make wood and paper products, and almost 5 percent of the energy consumed in Idaho. The rest remains in the forest and adds to the

fuel load for wildfires that defy control efforts," O'Laughlin says. "And it gets worse each year. Compared to ten years ago, there is almost three times as much dead wood in our forests."

Using woody biomass to create energy is a triple win.

The Western Governors' Association, using data developed by the U.S. Forest Service, estimates that there are 23 million acres of timberland in the 12 western states that are in need of thinning to reduce risk of uncharacteristically severe wildfires. O'Laughlin estimates that Idaho's share of these forest health treatments could sustainably either heat twenty campuses the size of the University of Idaho, or fuel two large standalone wood biopower plants and provide electricity for 100,000 homes.

Other environmental benefits from burning wood for energy are numerous.

Every unit of energy produced with biomass keeps a like unit of fossil fuels in the ground. Compared with coal, for example, biomass energy feedstocks have lower levels of sulfur or sulfur compounds. Perhaps the most significant environmental benefit of biomass, however, is a potential reduction in carbon dioxide (CO<sub>2</sub>) emissions. Biomass-based generation is assumed by international protocols to yield no net emissions of CO<sub>2</sub> because vegetation captures and stores CO<sub>2</sub> as part of the natural carbon cycle.

Utilizing biomass pays off economically as well. Direct beneficiaries include the residents of rural communities that have suffered as timber harvesting has declined.

"Timber harvest in Idaho is about half of what it was in 1990," says O'Laughlin. "Even though foresters know how to harvest timber while protecting wildlife habitat and water quality, national forest timber harvests have declined because of complex decision processes

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that invite and reward challenges to managers' decisions. These challenges result from court rulings that managers have not adequately documented the projected effects of their proposed actions. Much of the federal land management budget is spent pushing paper rather than actively managing resources."

Reliable supply is one of the primary challenges to utilizing woody biomass, and in Idaho three-fourths of the timber resource is on national forest land. The costs of harvesting and trans-

porting the small-diameter thinnings that contribute to forest health problems are high. Removing higher value timber for conversion to lumber along with small-diameter biomass is perhaps the best way to create favorable economics for wood utilization, according to many experts. The only other way is to fund forest health

improvements with subsidy payments from the federal treasury provided by taxpayers.

O'Laughlin agrees with other forest policy experts that the barriers to more widespread use of wood bioenergy are not technical, but social and economic.

His conclusion is optimistic: "As people begin to take seriously reduction of fossil fuel use and carbon emissions, today's socio-economic barriers to wood bioenergy will crumble and foresters will be empowered to use their scientific training and guiding land ethic to harness the biological power trees have to capture and store the sun's energy in a form humans have always used. We have a choice. We can burn the wood in a boiler, or in the inevitable wildfire."

