



Logging to save the planet? “Woody bioenergy” and climate change

Growing concerns about global warming and the rising cost of fossil fuels are driving the search for alternative sources of energy. One alternative source of energy will come from a familiar but unexpected place — Canada's forests.

The prospect of using wood from our forests to produce energy (called “woody bioenergy” amongst other things) has captured the attention of the forest industry and governments that are grappling with rising energy costs and stagnant markets for timber and paper. Woody bioenergy offers the prospect of contributing to the reduction of greenhouse gasses and generating energy and revenue for forest-dependent communities.¹

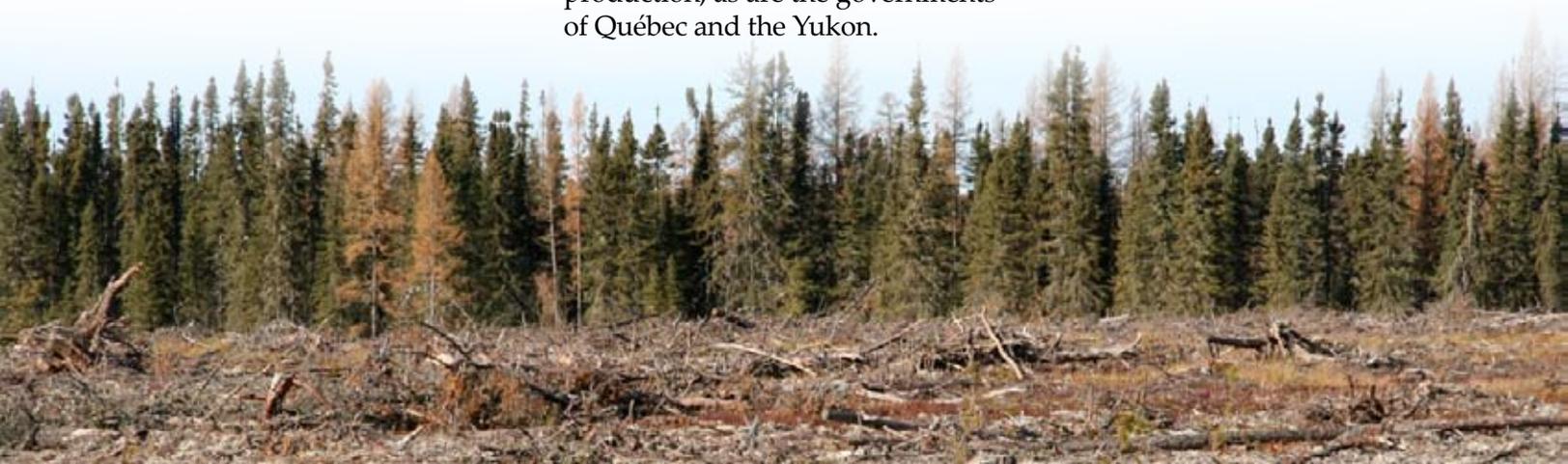
However, the emerging technologies and the demand for woody bioenergy also pose risks to our forests, to the creatures that live in them and the services they provide to Canadians and the world. This fact-sheet highlights some risks arising from woody bioenergy production and outlines steps that need to be taken before we significantly increase our use of this “alternative” energy source.

Provincial governments in Ontario and New Brunswick are currently developing policies to expand the development of woody bioenergy. British Columbia, already the Canadian leader in woody bioenergy production, is contemplating expanding woody bioenergy production, as are the governments of Québec and the Yukon.

Leave more, not less

Woody biomass includes standing dead trees, tree tops, limbs, fallen dead trees, shrubs and live standing trees, which are best left behind in the forest following logging. Increasing the removal of woody biomass increases the risks already posed by current practices. Woody biomass serves important ecological functions and the forest needs more of it, not less.

Below: Downed woody biomass in a recent clearcut in northeastern Saskatchewan.
Photo: Global Forest Watch Canada, 2006



Energy production from our forests



Above: Pine marten in a standing dead tree. Woody biomass left behind after logging provides important ecological services such as shelter.
Photo: CPAWS Wildlands League

Woody biomass can be converted to woody bioenergy in a number of ways. It can be burned as firewood to heat homes. It can be burned in industrial boilers to generate steampower and heat in a process commonly called, “cogeneration.” It can be added to coal-fired generators to reduce the use of coal in a process referred to as, “co-firing.” It may also be economically viable in the near future to turn it into biofuel in processes known as, “gasification” or “liquefaction”.²

One non-controversial source of woody biomass for bioenergy production is the leftovers from the forest products milling process. Sawmill waste, such as sawdust, and pulp mill waste, such as the black liquor left over from the pulping process, are an

excellent feedstock for woody bioenergy. The use of such milling waste already provides a significant source of woody bioenergy for the Canadian forest industry – 55% of the power used by pulp mills in Canada comes from post-milling waste — and helps to reduce the use of fossil fuels by the forest industry.³

But burning woody biomass may harm human health depending upon the technology used and the location of the burning. Precaution is warranted.⁴

Below: Removing bundles of woody biomass from the forest for bioenergy production
Photo: Tekes, Finland ⁸

Bottom of page: Clearcut east of Val d’Or, Quebec

Alternative, but not green

Advocates of the use of woody biomass for bioenergy production, such as the BioCap Canada Foundation, envision using the biomass left behind by logging, as well as increasing the logging of naturally disturbed forests, increasing the thinning of forests before commercial logging and increasing the overall rate of commercial logging in Canada.⁹



Impacts on biodiversity and ecosystem health

The emerging science of ecosystem-based management, to which Canada has committed itself, requires forest managers to leave more woody-biomass after logging – not less. Using the woody biomass left behind after logging – such as live trees and standing dead trees as well as dead and decaying downed trees, tree tops and limbs – for bioenergy conflicts with ecosystem-based management.⁵

The woody biomass left in the forest after traditional logging operations provides habitat for birds, such as woodpeckers and owls, and animals, such as pine marten. This woody biomass offers perches for birds such as the Great Grey Owl and shelter for creatures to hide under. It supports a wide diversity of small organisms from insects to fungi to moss, which work to break down the wood and return nutrients to the soil. It protects the soil from erosion into streams. It serves as a source of nutrients and moisture for the growth of new trees.^{6,7}

Solutions

Without adequate regulations to protect the forest from the excessive removal of woody biomass, woody bioenergy is likely to harm biodiversity and ecosystem services.

If woody bioenergy is going to provide an environmentally appropriate alternative energy source to contribute to the fight against global warming, CPAWS recommends that provincial governments take the following measures to maintain biodiversity and ecosystem functioning:

- Conduct an environmental assessment of the life-cycle impacts of woody bioenergy production
- Test the collection of woody biomass in a pilot program that will monitor and evaluate its environmental impacts
- Document the impact of woody bioenergy on greenhouse-gas production, paying attention to the impact on carbon sequestration in forest soils and carbon emissions incurred during logging and transportation
- Incorporate the demand for woody biomass arising from woody bioenergy production into wood supply calculations
- Regulate stand-level retention targets for logged areas, including the retention of standing dead-trees and representative patches of live-trees
- Regulate downed wood retention targets
- Regulate site soil-disturbance thresholds
- Ensure industry pays the public a fair market value for this new use of our public forests and to ensure that it is used efficiently to produce energy
- Regulate the planning of woody biomass collection to require the identification of sites where collection is to occur within forest management plans
- Require the assessment of a nutrient budget for each woody biomass collection site

Boreal Framework

Canada's Boreal is one of the world's last great forest ecosystems. Teeming with life, Canada's Boreal stretches across the country from the Atlantic to the Yukon. At a time when most of the planet's other great forests have been lost to industrial development, Canada's Boreal is still a living home to billions of migratory songbird, majestic caribou herds, a diversity of fragile plants and large predators like lynx and wolverine. Canada's Boreal provides essential ecosystem services that human society depends on, such as purifying the air that we breathe and the water we drink. As the largest terrestrial storehouse for carbon, Canada's Boreal is invaluable to a society struggling with the threat of global warming.

CPAWS is a founding member of the Boreal Leadership Council (BLC), a group of leading companies, Aboriginal organizations and conservation groups, who jointly support the implementation of the Boreal Forest Conservation Framework vision in Canada. The Framework's goal is to conserve the cultural, sustainable economic and natural values of the entire Canadian boreal region by employing the principles of conservation biology to:

1. Protect at least 50% of the region in a network of large interconnected protected areas, and
2. Support sustainable communities, world-leading ecosystem-based resource management practices and state-of-the-art stewardship practices in the remaining landscape.

References

1. Perlack, R. D., L. L. Wright, et al. (2005). Biomass as feedstock for a bioenergy and bioproducts industry — The technical feasibility of a billion-ton annual supply. Oak Ridge, TN, U.S. Department of Energy and U.S. Department of Agriculture: 78 pp.
2. Zerbe, J. I. (2006). "Thermal energy, electricity, and transportation fuels from wood." *Forest Products Journal* 56(1): 6-14
3. FPAC (2004). Embracing bioenergy - Greener energy and Canada's forest products industry. Ottawa, ON, Forest Products Association of Canada (FPAC): 2 pp.
4. Government of Canada (2005). Understanding health and heating with wood. Burn it Smart. Ottawa, ON, Government of Canada, Natural Resources Canada: 2 pp.
5. CFS (2003). Canada Forest Accord (2003-2008). Ottawa, ON, Government of Canada, Natural Resources Canada, Canadian Forest Service: 4 pp.
6. Voller, J. and S. Harrison, Eds. (1998). Conservation Biology Principles for Forested Landscapes. Vancouver, B.C., UBC Press. 243 pp.
7. Lindenmayer, D. B. and J. F. Franklin (2002). Conserving forest biodiversity: a comprehensive multiscaled approach. Washington, DC, Island Press. 351 pp.
8. Hakkila, P. and M. Aarniala (2002). Improving the forest chip production process - Loose residues into bundles. Wood Energy Technology Programme. Helsinki, Finland, TEKES: 2 pp.
9. Layzell, D. B. (2006). Towards a sustainable bioeconomy. Towards a sustainable bioeconomy - Biosphere solutions for energy and the environment. Ottawa, ON, BioCap Canada Foundation.



Contact: CPAWS

506-250 City Centre Ave
Ottawa, ON K1R 6K7
info@cpaws.org
www.cpaws.org

This factsheet is one of a series published by CPAWS. View all factsheets at www.cpaws.org.

Author: Aran O'Carroll. **Review comments from** Gillian McEachern, Jay Malcolm, Brad Cundiff, Trevor Hesselink, Roberta Clowater and Tony Iacobelli are gratefully acknowledged. **Design:** Sue Novotny

Below: Undisturbed Boreal Forest in Ontario.
Photo: Bruce Petersen