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Stakeholder perspectives on converting forest biomass to energy in Oregon, USA

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ARTICLE INFO

Article history:
Received 2 September 2009
Received in revised form
12 April 2010
Accepted 4 August 2010

Keywords:
Forest biomass utilization
Bioenergy
Stakeholder perspectives
Wildfire
Forest restoration
Public forest management

ABSTRACT

Within the state of Oregon, USA, there is considerable interest in the possibility of converting forest biomass to energy. A number of studies have assessed the technical feasibility of forest biomass energy, but few have focused on social aspects, an important consideration in projects involving public forests. This study explores the social context of converting forest biomass to energy, using qualitative research methods. Semi-structured interviews were conducted with forty individuals representing nine different stakeholder groups. Information gained through interviews was used to understand stakeholder views on forest biomass energy, including their perspectives on potential barriers and opportunities in Oregon. Findings indicate the most challenging barrier will be access to long-term, consistent supply. A related challenge is the long history of contention between parties over forest products coming from public lands. However, findings also show that there are many areas of common ground between these groups that have historically been at odds, such as agreement on the necessity of restoration treatments in certain forest types, the by-product of which could be used for biomass generation. Potential conflicts still exist, for instance over projects in mixed conifer forests. Development of policies and projects through inclusive, collaborative approaches could alleviate controversies, potentially allowing more activities to move forward. Information provided by this research creates a foundation for discussions as forest biomass energy becomes an increasingly prominent issue in Oregon, the western USA, and other regions of the world.

1. Introduction

The idea of generating energy from forest biomass has a long history; humans have been using wood heat for millennia and are still doing so today [1,2]. Over the years more sophisticated technologies have been developed, and today woody biomass can also be converted to bio-electricity, bio-fuel (liquid energy), and bio-gas. The popularity of biomass in industrialized countries waned for a period in the face of competition from fossil fuels, but is experiencing a global resurgence as more carbon-neutral and locally beneficial sources of energy are sought [3,4]. For instance, the 2006 EU Forest Action Plan calls for increasing use of forest biomass for energy [4], and many European nations have a growing forest bioenergy sector [1,3]. Similarly, the Energy Independence and Security Act of 2007 in the United States calls for increased use of renewable energy, including from woody biomass sources (see Sec. 806) [5]. Many U.S. states have bio-electricity generating facilities, particularly in relation to the forest products industry [1].

An emerging trend is the notion that converting biomass to energy can also help solve a forest management problem. In

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0961-9534/$ – see front matter © 2010 Elsevier Ltd. All rights reserved.
doi:10.1016/j.biombioe.2010.08.014

forests deemed to have an undesirable level of risk of fire or insect damage due to high tree densities, communities are turning to bioenergy facilities as a potential mechanism to utilize biomass and reduce risk. Examples include a central heating plant in Austria built in part to utilize storm-damaged trees [6], bioenergy facilities being proposed in Spain in part to reduce wildfire risk to local woodlands [7], and vast tracts of insect-killed forest being considered as a potential bioenergy source in British Columbia, Canada [8]. This trend is emerging in the United States as well [9]. In the southeastern United States, biomass energy is being promoted in part to prevent insect and wildfire damage to private forests, some of which have accumulated higher biomass due to a depressed timber market [10]. The trend is even more prevalent in the western United States [11–13] where millions of hectares of public and private forests are potentially in need of restoration treatment [14]. A proposed benefit is that vast quantities of otherwise unwanted material could be used, creating an end market and much needed revenue for the treatments themselves [9]. In addition, the restoration work, transportation of material, and operation of the energy facility could create family wage jobs [15] that could revitalize forest-based rural communities. In the state of Oregon (Fig. 1), this synergy of opportunities has created significant interest from multiple stakeholder groups [16–18], many of which do not have a history of working together.

At its foundation, forest biomass utilization is a forest restoration issue in Oregon, rather than an energy issue. Oregon electricity prices have historically been among the lowest in the nation due to abundant supplies of hydro-power, making it difficult for biomass energy to compete on the energy market [16,18]. However, in dry western forests, various forest practices (e.g., fire exclusion) have resulted in more small diameter trees than under historic conditions, putting them at risk for uncharacteristically large and severe wildfires [14]. Estimates from 2006 project that roughly 30% of forest land in eastern and southwestern Oregon (amounting to 1.7 million hectares) is in need of treatment; 70% of these hectares are federally owned [16]. Despite growing public support for active management to bring these forests back to more "natural" conditions [19], there are limited markets for the byproducts of forest restoration projects, making the treatments prohibitively expensive. While there is considerable interest in using byproducts of restoration treatments for value-added products (e.g., flooring, poles, animal bedding, etc.), current estimates project there is more supply than these markets can absorb [16,18]. Biomass energy facilities require substantially more material and could make up some of the gap between supply and demand.

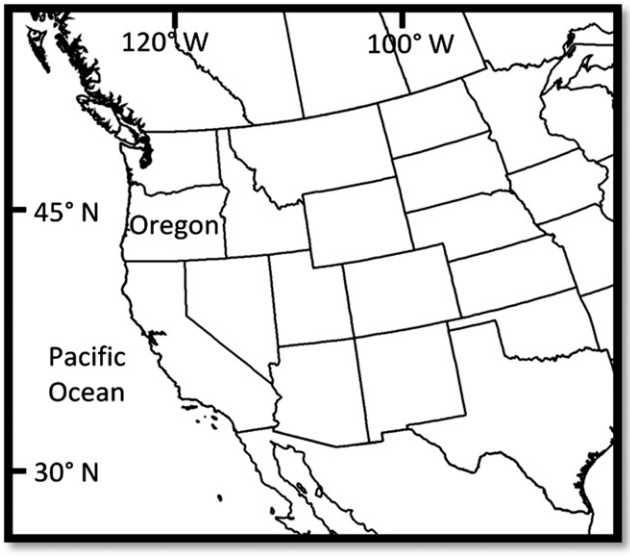

Fig. 1 – State of Oregon in the western United States.

Converting forest biomass to energy, as with many forest management activities in the western United States, has the potential to be controversial, particularly on federal lands (for an example of past conflicts see [20]). Any management action will have effects on forests, both intended and unintended, and concerns over anticipated effects or drawbacks to an action may result in lack of support by some segments of the public and forestry profession [9]. Since the majority of the projected supply would be coming from federal forests and all members of the public have a legally protected voice in federal forest management decisions, understanding and incorporating stakeholder perspectives early in the process may be essential to realize the potential of forest biomass utilization.

Research has shown that when the public views a management strategy unfavorably, the strategy will be extremely difficult to implement, regardless of whether it is silviculturally or ecologically sound [21–23]. This is particularly true in the context of public forests where environmental laws allow citizens the opportunity to challenge projects that they believe are not legal. Two recent decisions by the U.S. judicial system illustrate this concept as it pertains to fuels reduction treatments. One project in the state of Idaho was designed to restore an old-growth stand to historic conditions by removing timber in commercial logging contracts [24]. The conservationists who opposed the project viewed the U.S. Forest Service's actions as business-as-usual logging, disguised as forest restoration [25]. The second decision concerned an effort by the Forest Service to categorically exclude small-scale fuel reduction projects from National Environmental Policy Act (NEPA) analysis [26], which requires formal documentation of potential environmental impacts and extensive public input on proposed projects. Groups that want more public engagement in land management decisions often oppose categorical exclusions—particularly when they disagree with the prevailing management strategy. These cases highlight the potential for controversy when not all stakeholder perspectives are incorporated into forest restoration projects and policies. Similarly, biomass utilization projects worldwide will likely be less controversial if stakeholder perspectives and concerns are well understood and accommodated [2], particularly in this early stage of the movement. However, since the linkage between federal forest restoration and renewable energy generation is relatively new, there have been few studies examining how different stakeholders perceive these projects.

This research offers the first look at social perspectives on converting forest biomass to energy in Oregon from a diverse group of stakeholders. These stakeholders are common and potentially relevant to this issue in many parts of the world,