

Michigan's Energy Future: Is There a Role for Woody Biomass?



Issue Guide

MICHIGAN STATE
UNIVERSITY
EXTENSION



Community Issue Forums:

This issue guide was prepared by a partnership between Michigan State University Extension and the Michigan Agricultural Experiment Station.

The purpose of this issue guide is to provide citizens with information to support locally initiated public conversations about the role of woody biomass in Michigan's future. Issue guides are most successful when used in public forums where citizens can explore together the challenges required to make responsible decisions to move toward a sustainable future.

This issue guide is divided into three sections. We begin by laying out a brief description of the development of biomass in Michigan. We then present three approaches to addressing challenges presented by biomass harvesting, production and conversion. In a nutshell, these are three different positions or points of views that are commonly held on this topic. Lastly, we have included a questionnaire for you to give your input into this topic.

Even though we are all consumers of energy and are affected by it in different ways, this issue guide will provide background information to help citizens take a fresh look at familiar problems. As citizens make decisions about what is in store for our energy future, they will be making judgments about the fabric of public life.

Accessing this Document:

Additional copies of this document may be retrieved free of cost at the Michigan Food Democracy Project website: www.fooddemocracyproject.org. The eight minute video, "Biomass in Michigan's Future?" can also be downloaded from this website. Both the video and issue guide should be used in tandem to provide citizens the tools to best understand these issues. For additional support in organizing a conversation in your community, contact Wynne Wright 517-884-1372.

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Michigan's Energy Future



Introduction

Something new is happening in our relationship to energy in Michigan. Residents believe it is time to make some difficult decisions about our energy future. Talk of biofuels, biomass, and biodiesel frequently figure prominently in discussions from legislative corridors to small town cafés. One look at the media and we might conclude that something distinctively new is on our energy horizon. Consider the following newspaper headlines: “Wood Burning Power Plants Picking Up Steam in Great Lakes States,” “Buzz About Dow Corning Biomass Facility a Boon to Midland,” “Hundreds Turn Out to Question Biomass As Renewable Energy,” “Study Questions Biomass' Ability to Cut Greenhouse Gases.” Have these headlines captured the essence of this debate? Is the issue of using biomass as an energy source that black and white? Or do these headlines gloss over the many complicated considerations we as citizens must make to ensure a sustainable energy future? The answer is unclear, but these headlines

do reveal that Michigianians are not only reconfiguring their relationship to energy, they appear to be uncertain as to how they should go about charting a sustainable energy future.

Such confusion leaves citizens asking hard questions, “How should we fuel our energy needs? Can biomass be a part of a sustainable future? Will biomass production and conversion create jobs for our communities or will it simply shift jobs from one area of the economy to another? How will we treat our forests? Can the forests serve all our needs – wood, paper, energy, recreation, and biodiversity? How do private land holders figure into new supply chains? What are the economics of these new enterprises? What will be the impacts on our state land, communities, our farms, and our water quality?” As things stand, there is broad agreement that change is needed, and even long past due. Concerns about loosening our ties to Middle Eastern fossil fuels are commonplace, as is our desire to ensure we improve our impact on the environment. There is little agreement, however, about how to achieve these demands given current realities.

Setting the Stage

The Great Lakes states are coming under increased public and institutional scrutiny to develop alternative forms of energy, in part because they are ranked among the top in the nation for greenhouse gas production. High levels of greenhouse gas emissions are linked to the over one hundred and fifty coal plants operating in the region. In forested states such as Minnesota, Wisconsin, and Michigan, locally available woody biomass may be part of a renewable energy solution.

Biomass is any organic material. It is derived from living, or recently living organisms, such as plants as well as animal and vegetable materials. When people talk about woody biomass, they are specifically referring to any wood based material that is suitable for supplying energy production. The State of Michigan defines woody biomass as a renewable resource capable of being “replenished over a human, not a geological timeframe.” That means biomass is renewable through natural processes or from human activity, such as planting perennial crops.

Woody biomass consists mainly of whole trees which have little economic value in other sectors of the economy. It also refers to the residue from logging, such as left-over tree tops or limbs. Lastly, woody biomass can also refer to fast growing perennial varieties of trees and grasses. Examples include switchgrass, poplars, and willow.

Biomass is used for generating electricity to power our homes and workplaces. It can also be used to produce fuels and other consumer products. To achieve renewable energy goals, technologies such as wind and solar are being implemented, but for a state half covered in forests with millions of acres of fallow farmland, woody biomass is being heavily promoted.



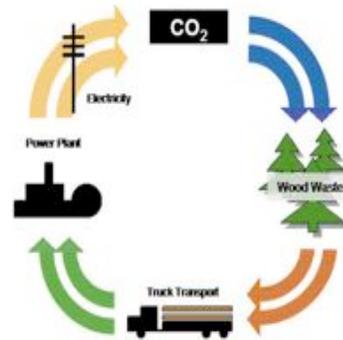
Many believe woody biomass is capable of supplying a continuous supply of electricity, whereas other technologies, although less polluting, can only supply intermittent power.

When compared with the fossil fuels that traditionally supply the state’s power, woody biomass is less energy dense and more expensive to transport and store. To meet this energy gap, federal and state grants and incentives are being implemented to encourage market development. Without such policy support, renewable energy technologies are cost prohibitive. The following table highlights some of the federal and state legislation that has enabled the development of biomass energy production.

Policy	Governance	Year	Intent	Result
Clean Air Act	Federal	1970	Reduce pollution from fossil fuels	Stabilized a biomass market
Public Utility Regulatory Policies Act	Federal	1978	Encourage use of wood waste for energy	Development of first wave of wood burning electricity generating plants
Energy Policy Act	Federal	2005	Promote use of biomass	Industry growth
Energy Independence and Security Act	Federal	2007	Mandate energy production from biomass	Industry growth
Food, Conservation and Energy Act	Federal	2008	Provide Biomass Crop Assistance Program (BCAP)	Incentive to supply biomass to industry
American Recovery and Reinvestment Act	Federal	2009	Provide Tax Credits for private developers of new or retrofitted biomass facilities	Heightened number of proposed new and retrofitted biomass plants
Clean, Renewable and Efficient Energy Act	State	2008	Established a Renewable Energy Standard for the State of Michigan	Mandates 10% of the state’s electricity to come from renewable resources by 2015
45 by 20	State	2009	Reduce Michigan’s reliance on imported fossil fuels 45% by 2020	Impediments to permitting new coal fired power plants

Federal legislation in 2007 and 2008 introduced mandates and incentives to produce cellulosic ethanol and also electricity from wood. Pending legislation also seeks to introduce mandates for the production of renewable electricity. The greatest single policy incentive, responsible for much today’s push to develop new biomass facilities, results from a federal tax credit reimbursing thirty percent of a developer’s capital investment, in cash, for projects that begin operation before December 31, 2013.

In 2008, Michigan set a “Renewable Portfolio Standard” calling for ten percent of electrical production to come from renewable resources by 2015, setting a course for a forty-five percent reduction of coal generated electricity by 2020. Additionally, some communities are setting their own goals for reducing the use of nonrenewable resources and increasing energy efficiency in the hopes of reducing energy costs and the use of coal along with increasing local economic development.



To combat current physical and technological limitations of biomass, government, industry, non-profit organizations, and universities are working to research and develop new processes, technologies and infrastructures. Since September of 2007, the U.S. Department of Energy has funded laboratories across the country where these diverse sectors work together to develop new products, methods and tools the emerging industry can use. Michigan State University is home to one such center. Additionally, along with Michigan Technical University, researchers from the two universities are undertaking a comprehensive inventory of the state’s biomass and forest resources.

In light of these recent political, technological, and social developments, a number of biomass facilities are in the pipeline, seeking to incorporate multiple technologies, products, ownership models, and distribution networks. Some proposals advocate privately owned, mid-sized “stand-alone” generators, offering modest efficiencies at relatively low costs. Other proposals are advancing smaller, more advanced and efficient combustion technologies forwarded by municipalities and district energy cooperatives. Beyond electricity, wood is being promoted as a direct replacement to fuel oil and coal on small scales across northern Michigan’s schools, universities and hospitals. And on a much larger scale, some believe wood has a role in advancements in ethanol production in the form of cellulosic ethanol, with a state-of-the-art facility proposed in the Upper Peninsula.

Using wood for energy is not a new idea. Since the retreat of the glaciers, people living on the land now known as Michigan have used the local forests. Michigan forests fueled the industrial revolution as the nation’s leading supplier of lumber the latter half of the 19th century. During this time, copper and iron ore mining booms contributed to non-renewable levels of resource consumption, fostering a new era of conservation beginning at the turn of the twentieth century, which foresters believe has steadily replenished forests. While people have often used wood to heat their home or businesses, the energy crisis of the 1970s, coupled with increased public concern for the negative environmental attributes associated with fossil fuels, led to federal laws which encouraged the use of wood for distributed electrical production.

As a result, six Michigan based wood-burning electrical plants, producing around 30 megawatts of power each for distribution to in-state utilities, began operating during the 1980s and 90s. These plants were fed by “waste wood” from nearby forest industry

operations, once a successful industry in the state. Although still in operation today, these electric plants face new challenges in procuring wood with the steady decline of the state's forest industry.

Today, many federal, state, industry and community leaders and decision-makers are championing woody-biomass energy production as a means to supply renewable energy while creating jobs and building local economies in a state reeling from the loss of 400,000 manufacturing jobs since 2003. Academic and state foresters point out how the decline in forest-based industry along with an increase in forest productivity has led to an excess of wood capable of supplying a steady stream of woody-biomass to a new renewable energy



economy. Government and community leaders are interested in utilizing this locally available and potentially cost effective resource in lieu of continued reliance on fossil fuels such as coal. Loggers too are excited at the prospect for a new market to sustain their livelihoods.

Statewide, a general consensus has largely been reached about the need to reduce the use of fossil fuels and increase renewable energy production. How to meet this goal, however, remains contested.

At the heart of these differing views is a concern for sustainability. When we speak of sustainability we want to make sure that we are using our natural resources in ways that do not threaten our economies, or the environment, or create social/cultural problems. Can we fulfill the energy needs of the present generation in an economically lucrative way that does not damage natural resources or threaten social relations? If so we will be protecting opportunities for future generations to benefit from our natural resources in much the same way we have. Whether we can achieve this vision of sustainability remains a question.

We're in It Together

Our energy challenges remind us that we are linked together in a global human community and that what impacts us in one state or nation can have ripple effects and impact others in ways we never intended or even considered. Challenges associated with our energy future are topics that cannot be solved in isolation. Yet, before people can act together, they must talk to each other. One way to begin tackling these difficult issues is through public deliberation. Public deliberation involves people talking face-to-face in a way that allows all points of view to be heard, generates respect among participants and acknowledges that there is strength in the diversity of perspectives. In this way, communities can make sound decisions that build on the best and brightest ideas available.

Considering the Role of Woody Biomass in Our Future

This issue guide is intended as a catalyst for community conversations. In this issue guide, we use the case of woody biomass production and conversion as an entrée into the conversation.

In the next three sections we present three major approaches, or choices, for addressing the role of woody biomass in Michigan's energy future. Each approach sees the world a bit differently and makes claims that support a different understanding of the challenges before us and diverse strategies for implementing woody biomass into our energy needs. These options are not meant to be exhaustive; they provide a window into the critical issues we face and the tensions and challenges that accompany each course of action. Each approach is laden with diverse values and assumptions about human beings and social action that underpin their recommendations. Each approach also embodies tensions and struggles that draw our attention to the sacrifices, or trade-offs, that are required when we choose one path over another.

Approach One: Multiple Benefits from Woody Biomass¹

Supporters of this Approach say that it is long past time for us to stand up and take our energy needs seriously. Growing longevity in industrialized countries and annual population growth suggests that the world will need more and more energy to meet our global needs. Where will it come from? To meet the growing worldwide demand for energy, we must look to alternative and renewable sources of energy. Biomass is a promising sustainable resource to meet this challenge. Woody biomass is well suited to Michigan given our abundant forestland. It can help wean us from our dependence on Middle Eastern fossil fuels, stimulate economies, grow jobs, and revitalize rural communities.

Approach Two: Developing Our Communities

Supporters of Approach 2 agree that much is needed to reinvent our energy system and renewable sources must be a part of that future. Woody biomass, however, is not a perfect solution because it is bulky to move and store. This obstacle can be harnessed to ensure we link biomass development to rural revitalization. In order for biomass to support rural community development we must prioritize ownership, infrastructure, and scale issues that are appropriate to the community. Failure to prioritize the geographical context in which the biomass is located through policies and programs will result in a loss of benefits to rural people and places.

Approach Three: Unrealistic Sources

Supporters of the final approach argue that woody biomass is the wrong path to meet our state's energy needs. Biomass is destructive to the forests, clearing thousands of acres of forestland that is part of our public domain, for private use. Biomass is also devastating for public health, creating challenges for residents in the surrounding communities who will be exposed to air pollutants. In short, insufficient attention is being paid to the complexity of how these new agri-energy systems will interact with and impact both humans and the environment.

¹ Each of these three approaches were developed from data derived from one-on-one interviews, community forums, and an analysis of existing literature on the topic of woody biomass development.

