

West Michigan Wind Assessment

STATUS AND TRENDS OF WIND ENERGY DEVELOPMENT

BACKGROUND

The West Michigan Wind Assessment project team is comprehensively analyzing the benefits and challenges of wind energy development in coastal West Michigan, including Oceana, Muskegon, Ottawa and Allegan counties. This fact sheet summarizes the findings of their first report, *Status and Trends of Wind Energy Development in West Michigan*. Additional reports will examine potential impacts from a variety of perspectives and evaluate policy options for minimizing conflicts. For more information or to access the full report, please visit the project web site: www.gvsu.edu/wind.

RENEWABLE ENERGY IN MICHIGAN

New laws require that Michigan expand its production of renewable energy, such as wind and solar power. The state's renewable energy standard specifies that electricity providers generate 10 percent of their electricity using renewable sources by 2015. Renewable sources accounted for less than 3 percent of the total energy Michigan produced in 2007 (Figure 1). Michigan will need to increase its renewable energy capacity to more than 2000 Megawatts (MW) to meet the target, which represents enough power to support about 600,000 homes. Many experts expect wind energy to provide the majority of Michigan's renewable energy needs over the short term because:

- Wind turbine technology is relatively mature and reliable;
- The cost of wind energy production is competitive with current sources of electricity; and
- Michigan has strong wind resources.

WIND ENERGY IN WEST MICHIGAN

As of July 2009, Michigan had 83 utility scale wind turbines, generating about 130 MW of wind energy (Figure 2). Currently there are no existing wind energy facilities in west Michigan.



A pair of 1.8 MW wind turbines, Bowling Green, OH. (E. Nordman)

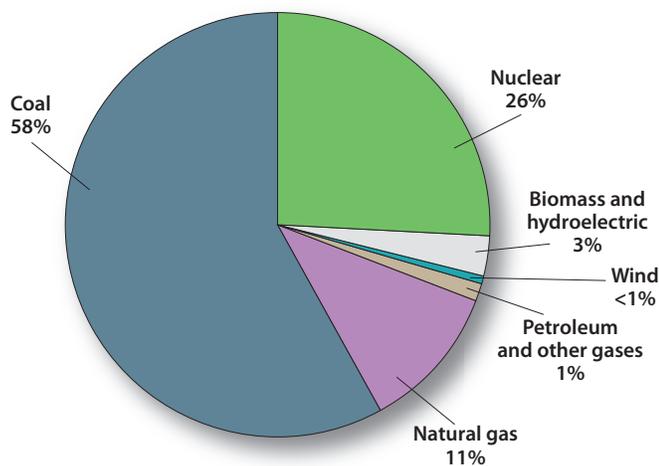


Figure 1. Sources of electricity in Michigan, 2007.

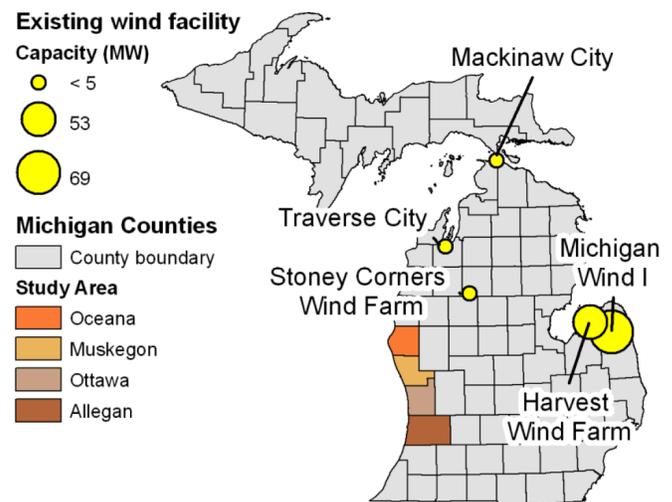


Figure 2: Existing wind facilities in Michigan in July 2009.

The Wind Energy Resource Board found that Allegan County is one of four regions with the highest wind power production potential in Michigan (Figure 3). In order to meet the new standards, some electricity providers are planning to develop their own wind farms, while others will purchase energy from third parties.

- Consumers Energy is planning for 900 MW of renewable capacity by 2017 (more than required). Consumers plans to own some of the facilities and purchase power from others.
- Great Lakes Energy Cooperative already purchases renewable energy from the Harvest Wind Farm.
- Holland Board of Public Works plans to purchase renewable energy from a landfill gas project and is investigating potential wind projects at Windmill Island and elsewhere in the state.
- Four wind projects are in the planning stages in the west Michigan study area, which represent 12 percent (updated March 2010) of the currently planned wind capacity for the state.

WIND TURBINE ORDINANCES

In Michigan, wind farms are regulated primarily through local zoning ordinances. About 70 percent of west Michigan townships have a wind turbine ordinance in place or in development (Figure 2). Although Allegan County has high wind power potential, the county has the lowest proportion of townships with wind ordinances.

UNIQUE WIND RESOURCES IN MICHIGAN

Michigan has fewer wind farms than many states, but its manufacturing base is an asset to the wind turbine industry. According to the National Renewable Energy Laboratory, two of Michigan's eight wind turbine component manu-

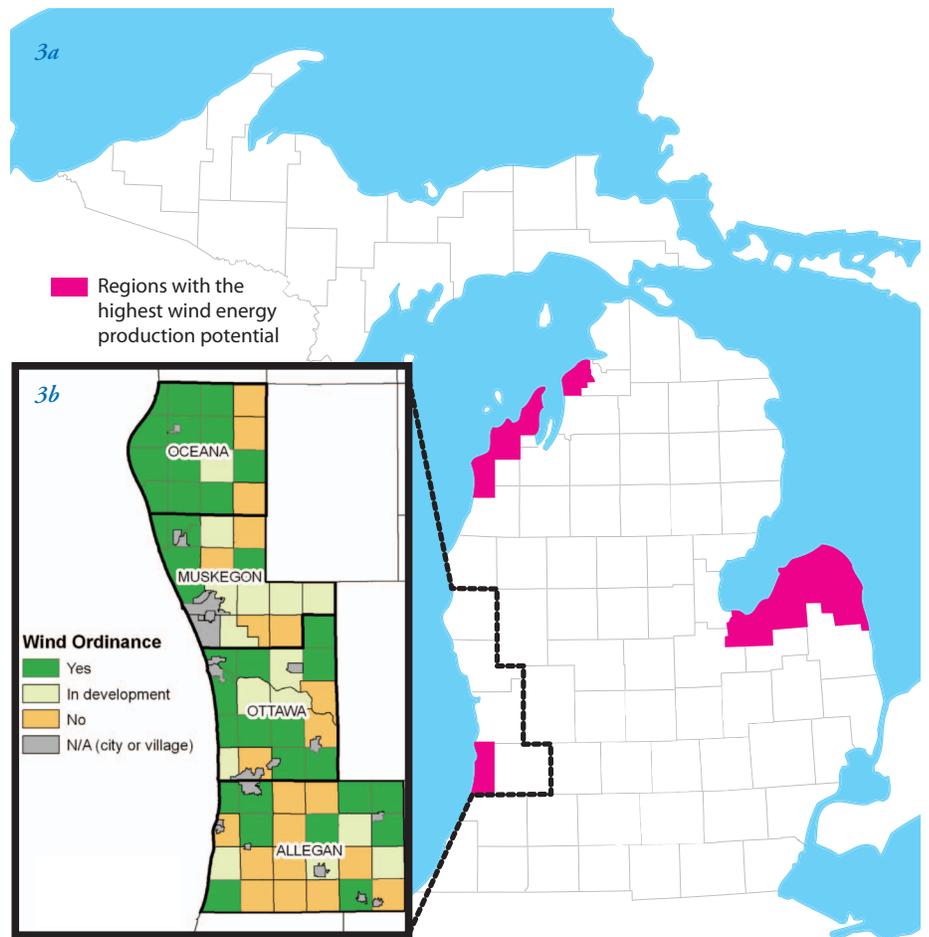


Figure 3a) Regions found to be most favorable for wind energy development by the State of Michigan's Wind Energy Resource Board. 3b) Status of local wind turbine ordinances in 2009.

factures are located in west Michigan. Additionally, a Holland, Michigan based company plans to manufacture wind turbine blades.

Currently there are no offshore wind farms in the US, although many states, including Michigan, are exploring possible offshore wind energy development. Turbines can be feasibly installed in shallow waters less than 100 feet deep. The Great Lakes Wind Council estimated that only 7 percent of the shallow waters of the Michigan's Great Lakes are most favorable for wind development. The shallow areas off the

coast of west Michigan are windy, but are not considered most favorable for development because of potential impacts to developed areas and natural resources along the coast.

Future reports and factsheets by the West Michigan Wind Assessment will evaluate the potential effects of onshore and offshore wind development for communities, the economy, and the environment. The research team hopes to develop information and tools that will help communities minimize conflicts.



Michigan Sea Grant enhances the sustainability of Michigan's coastal communities, residents, and businesses through research, outreach and education.



Principal Investigator: Erik Nordman, Ph.D.
 Assistant Professor of Natural Resources Management
 Grand Valley State University
 nordmane@gvsu.edu