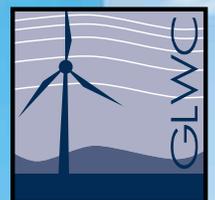


The Great Lakes Wind Collaborative

Prospectus



Great Lakes
Wind Collaborative





Cover photo: wind turbine in Meadow Lakes Wind Farm, Wolcott, Indiana, © Ben Husmann.

This page: Wethersfield Windpark in Wyoming County, New York, © T. Yonker.

The Great Lakes Wind Collaborative (GLWC) Prospectus was prepared by the staff at the Great Lakes Commission: Anjali Patel, 2009-2010 Great Lakes Commission-Sea Grant Fellow, Victoria Pebbles, Program Director, John Hummer, Project Manager, and Becky Pearson, Project Manager. The GLWC extends its appreciation to Jeff Gosse and Bob Krska of the U.S. Fish and Wildlife Service for assisting with the History of the Great Lakes Wind Collaborative section.

The GLWC does not endorse particular technologies or companies. Decisions made and products produced by the GLWC are advisory in nature and based on the consensus of its members. They do not necessarily reflect the personal opinions or positions of individual agencies, organizations, companies, or individuals who are members of the GLWC.

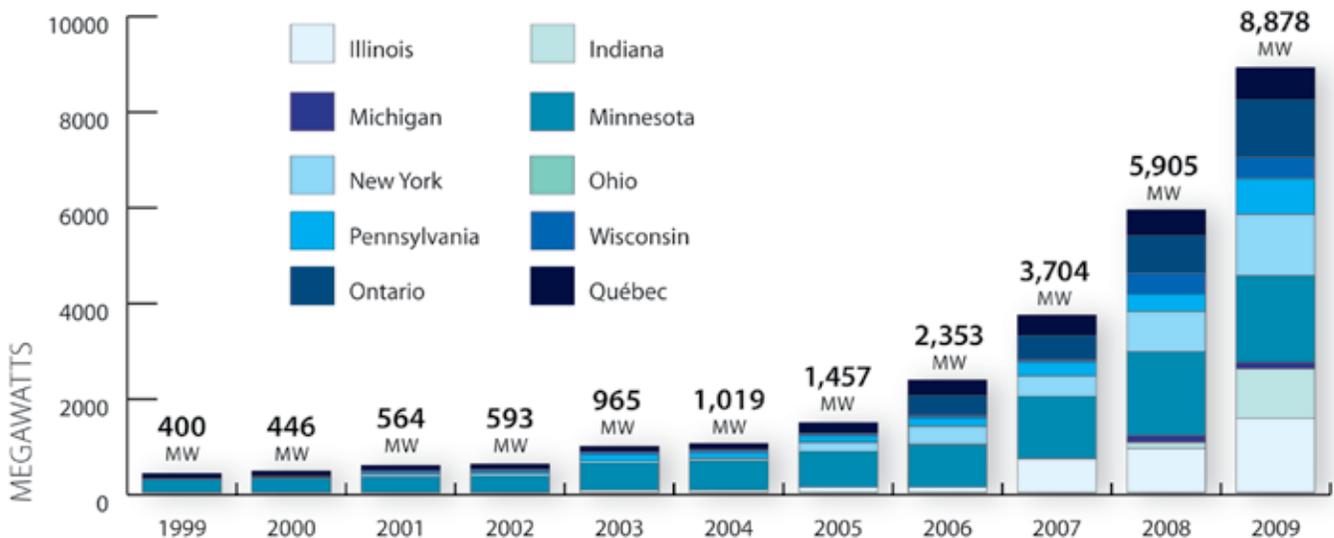
The Current State of Wind Power in the Great Lakes Region

The binational Great Lakes-St. Lawrence Seaway region¹ has high potential for both onshore and offshore wind power development. In a region where the energy portfolio is traditionally dominated by hydro and thermoelectric power, wind power has been increasingly successful in penetrating the energy market. This is largely due to federal and state/provincial policies which promote wind power as a source of clean renewable energy and provide financial incentives for developers and manufacturers to locate in the Great Lakes region.

Installed onshore wind capacity in the Great Lakes region increased from 400 MW in 1999 to 8,876 MW at the start of 2010.² As of mid-2010, an additional 5,809 MW of onshore wind projects were either under construction or have a signed power purchase agreement in place.³ Furthermore, offshore wind projects have been proposed in all of the Great Lakes, as well as in Lake St. Clair.

Along with the binational growth of wind energy projects, other sectors supporting the wind energy market have grown exponentially. A number of Great Lakes colleges and universities are now offering wind energy and technical training programs. The region's mature transportation sector, including trucking, rail and ports allows the region to respond to the specific needs of the wind energy sector. Most importantly, wind turbine and turbine components manufacturers are increasingly locating in the Great Lakes region.

Figure 1. Installed Wind Capacity in the Great Lakes Region



The manufacturing sector for the wind industry has grown significantly in the past several years, adding, announcing or expanding over 100 facilities since 2007. Currently, well over 240 facilities across the U.S. supply the wind industry, up from a few dozen in 2004, and this figure does not capture many additional facilities at the sub-supplier level. Wind manufacturing facilities can be found in every region of the United States, and include major new wind-dedicated facilities as well as established businesses that have diversified into the wind energy industry.⁴

With a well-established base of manufacturers with the workforce, research, and technology to support heavy industry and wind turbine component manufacturing, supplying original equipment manufacturers (OEMs) in the wind sector is an ideal growth market for manufacturing firms in the Great Lakes region. Additionally, the region is home to multiple international leaders that operate research and development centers. This capacity, along with the market diversity of the component manufacturing base, has made the Great Lakes region a global supply center for the wind industry.⁵

1 The binational Great Lakes-St. Lawrence region includes the ten jurisdictions that border on the Great Lakes and St. Lawrence River: the U.S. states of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin and the Canadian provinces of Ontario and Quebec.

2 U.S. Department of Energy and CANWEA

3 AWEA (December 2009), U.S. wind energy projects, downloaded June 2010 from <http://www.awea.org/projects/>; CANWEA (April 2010), Canadian wind energy projects with a signed power purchase agreement and/or already under construction, downloaded June 2010 from <http://www.canwea.ca/pdf/Proposed%20projects.pdf>.

4 American Wind Energy Association, BlueGreen Alliance, and United States Steelworkers. *Winds of Change: A Manufacturing Blueprint for the Wind Industry*, June 2010.

5 Great Lakes Wind Network, <http://www.glwn.org/info.aspx>.



*Wind turbines of Blue Sky Green Field Wind Farm
in Fond du Lac County, Wisconsin, © David W. Feldbruegge.*

Challenges to wind development

Despite considerable growth of the wind energy industry over the past decade, there are still a number of impediments which preclude the sustainable development of wind energy at a capacity sufficient enough to meet the renewable energy goals laid out by U.S. and Canadian federal and state/provincial governments. In the Great Lakes region, the chief barriers to development include:

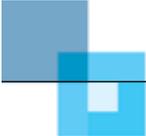
- Gaps in research and data related to environmental, economic and social impacts of offshore and onshore wind energy;
- Incomplete public access to GIS data due to information sharing restrictions, or the absence of crucial data;
- Insufficient, inefficient, or inconsistent permitting procedures;
- An inadequate and aging transmission grid and undefined cost allocation/recovery policies;
- Incomplete understanding of public concerns, and a lack of tools for addressing those concerns; and
- Unstable energy market conditions (including fuel prices).

Through its multi-tiered membership, the Great Lakes Wind Collaborative addresses, or works with partnering organizations, to address these and other issues on a regional scale.

Operating Principles

The GLWC reaches across sectors and disciplines to objectively identify and address the technical, environmental, regulatory, educational and financial issues related to the deployment of wind energy resources. The GLWC does not engage in advocacy activities.

The GLWC is guided by its annual workplan, which is supported through stakeholder contributions, foundation grants, government funding, and in-kind services provided by its members.



Mission Statement

The Great Lakes Wind Collaborative (GLWC) is a multi-sector coalition of wind energy stakeholders working to facilitate the sustainable development of wind power in the binational Great Lakes region.

The GLWC and its members recognize that the credibility and authority of the GLWC's work products derive from the fact that they were developed through the cooperative efforts of a wide range of concerns and perspectives. All committees and their members make decisions by consensus. The GLWC defines consensus as overwhelming agreement among GLWC members attained through a good-faith effort to meet the interests of all stakeholders.

History of the Great Lakes Wind Collaborative

The Great Lakes Wind Collaborative was established to advance the sustainable development of wind energy in the binational Great Lakes region. The Collaborative was the result of two independent efforts that expressed interest in creating an organization to examine and address key issues of wind development on a regional scale.

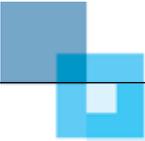
The first effort stemmed from a conference in June 2006 in Toledo, Ohio entitled *Toward Wildlife-friendly Wind Power: A Focus on the Great Lakes Basin*. It was sponsored by Congresswoman Marcy Kaptur (OH-9) and organized by the U.S. Fish and Wildlife Service (Service), U.S. EPA's Great Lakes National Program Office, and others. Participants identified the many opportunities for wind power development in the Great Lakes region as well as the associated concern for impacts on wildlife resources. To build on the momentum of that meeting, the Service, led by Jeff Gosse and Robert Krska, convened a follow-up *Great Lakes Wind Power Workshop* at the *State of the Lakes Ecosystem Conference* in Milwaukee in October 2006. Participants in this workshop continued exploring the benefits of establishing a regional forum to bring together stakeholders to address these issues in the region.

Concurrently, Larry Flowers, from the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) and former Director of Wind Powering America, began work on establishing regional wind working groups. Larry had been involved in establishing state wind working groups, but he also recognized that deployment of wind power may advance more rapidly and responsibly if states work together at a regional scale to share lessons, develop research and jointly address wind power concerns.

These two efforts merged in May 2007, when the Service and NREL, assisted by the National Wind Coordinating Collaborative (NWCC), convened a meeting of 45 Great Lakes wind power stakeholders in Chicago, Illinois. The stakeholders recognized the work of organizations such as NWCC, which address wind power development on a national scale, but identified the need to establish a mechanism to address issues specific to the Great Lakes region in a timely manner. An Acting Steering Committee was formed with several organizations stepping up to move this idea forward.

Subsequently, at a meeting of the Great Lakes Commission in October 2007, a recommendation was offered to establish the Great Lakes Wind Collaborative as a stakeholder-based forum with administrative support from the Great Lakes Commission.⁶ The Great Lakes Commission membership unanimously supported that recommendation, as did the Acting Steering Committee of the newly-formed Collaborative shortly thereafter, and the Great Lakes Wind Collaborative was born.

⁶ The Great Lakes Commission is an interstate compact agency established in 1955 to help its Member states and provinces speak with a unified voice and collectively fulfill their vision for a healthy, vibrant Great Lakes - St. Lawrence River region. More information on the Great Lakes Commission can be found at www.glc.org.



The fundamental purpose of the GLWC is to provide a forum where all parties with a stake in wind power development can collaborate in identifying and addressing issues of mutual concern across sectors in a proactive and non-confrontational way.

Organization and Membership

The GLWC strives for a broad, balanced, and binational membership. Members include stakeholders from a wide spectrum of interests and societal sectors throughout the Great Lakes region who provide diverse perspectives. The GLWC's Charter establishes the membership structure and guides its operations.

The GLWC operates through a three-tiered structure:

- **Wind Stakeholders** is the broadest category that allows participation by all interested parties. Wind Stakeholders receive regular updates on GLWC activities and may be invited to participate on GLWC workgroups and assist with special projects.
- A **Steering Committee** with broad representation from multiple sectors of wind stakeholders governs the GLWC's overall operations and is charged with appropriately representing sectors' broadest interests on all GLWC activities.

Co-Chair: Terry L. Yonker, Member-at-Large | Co-Chair: Cathryn N. Lucas, Ohio Department of Natural Resources

- **Issue-specific Workgroups** carry out the majority of the GLWC's workplan. These are assembled on an as-needed basis to focus on priorities identified by the GLWC membership. As of 2010, there are five standing workgroups:

- The Economic Development Workgroup is engaged in collecting, sharing and disseminating information and products related to the quantification and evaluation of economic impacts from wind energy development in the Great Lakes region.

Chair: David G. Loomis, Illinois State University

- The Offshore Wind Workgroup provides a forum to identify and address issues affecting the planning, development, and operation of offshore wind power facilities in the Great Lakes.

Chair: Kevin Edwards, Ontario Ministry of Natural Resources

- The On-Line Wind Atlas Workgroup is developing a comprehensive online wind data clearinghouse that includes information such as weather patterns, ecological conditions, and environmentally sensitive areas in the Great Lakes region. The Wind Atlas provides a screening tool for assessing wind development issues and opportunities on a geographic basis.

Chair: Jeff Gosse, U.S. Department of Interior, Fish and Wildlife Service

- The Regional Transmission Workgroup identifies and addresses challenges at the state, provincial and regional level with regard to reliability, access, and the efficient delivery of wind energy in an environmentally and socially responsible manner.

Chair: John Osinski, New York Power Authority

- The Siting and Permitting Workgroup collects and shares existing information and research, investigates and recommends best management practices (BMPs), and facilitates the identification of research and policy needs related to the planning, siting and permitting of wind facilities in the region, especially in relation to the environmental and social impacts of wind energy development.

Chairs: Steve Ugoretz, Wisconsin Department of Natural Resources and Steve Rice, JFNew

Additionally, workgroups contribute input to special initiatives and grant-funded projects.

Regional Services

To achieve its objective of providing a forum for stakeholders to share information, generate informative materials and build regional consensus on issues related to wind development in the binational Great Lakes region, the GLWC offers several key services:

- Information Exchange
- Research and Policy Development
- Education and Outreach
- Facilitation and Consensus Building



Wind turbine along Lake Ontario in Toronto, Ontario, Canada, © Diego Silvestre.

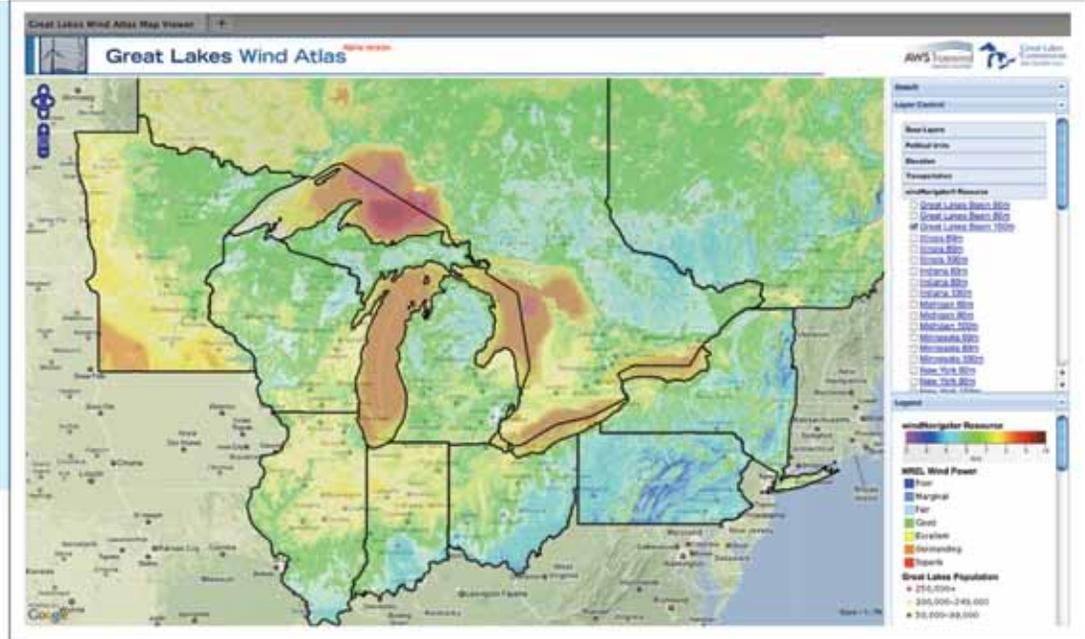
Information Exchange

The cornerstone of the GLWC's activities is to serve as a conduit for interested stakeholders in the region to exchange ideas, information and data. GLWC activities help facilitate dialogue among stakeholders from multiple groups to identify regional needs and share questions, concerns and updates on new developments in a timely manner. These open and transparent discussions improve knowledge and strengthen the relationships among GLWC members.

The GLWC's continuing information exchange efforts include:

- **Workgroup Calls**
Individual GLWC workgroups generally hold monthly or bi-monthly calls to discuss progress on GLWC workplan projects, provide up-to-date information on wind regulations and policy, and provide a forum in which stakeholders can share their news on developments in their jurisdictions and within their organizations.
- **Annual Meetings**
The GLWC Annual Meetings bring together the organization's broad membership and other interested parties to share and develop information related to the responsible advancement of wind energy development in the Great Lakes region. Past annual meetings have been held in Buffalo, Milwaukee and Cleveland and rotate around the basin to a different location each year.
- **GL-Wind Listserv**
GL-Wind is an electronic forum for sharing news and issues of interest regarding wind energy in the Great Lakes region. Postings include the release of new reports, policy issues, requests for proposals, and announcements of wind conferences or special Great Lakes wind-related events. The listserv allows wind stakeholders to keep abreast of both regional and national activities that advance the sustainable development of wind energy.
- **GLWC Web Site**
The GLWC website, www.glc.org/energy/wind, is a one-stop electronic hub for all activities and efforts of the GLWC. The website includes an overview of the GLWC, an events page, a publications and outreach page, a wiki that houses information on each of the GLWC workgroups, and a Great Lakes Wind Bibliography. The website also includes a link to the GLWC's *Best Practices to Accelerate Wind Power in the Great Lakes Region and Beyond* project. This DOE-funded project is guided by an ad-hoc workgroup. Future grant-funded projects of the GLWC will also be linked from the GLWC website.
- **GLWC E-Newsletter**
The GLWC periodically publishes an online newsletter to bring stakeholders up-to-date on GLWC projects, workgroup efforts, state/provincial wind power updates, and other timely news items.

The **Great Lakes Wind Atlas** is a clearinghouse of GIS data related to onshore and offshore Great Lakes wind development and a publicly accessible internet tool.



- **Data Collection, Integration and Research**

The GLWC’s data collection and sharing efforts connect stakeholders with relevant policy documents, scientific research, and GIS data in order to promote informed decision-making. Two products showcase these efforts.

- **The Great Lakes Wind Atlas** (Wind Atlas), housed online at erie.glin.net/wind, is a clearinghouse of GIS data related to onshore and offshore Great Lakes wind development. This publicly accessible internet tool allows users to learn about available data while still maintaining the appropriate restrictions on sensitive data layers. The Wind Atlas has been operational since May 2009.
- The GLWC **Great Lakes Wind Bibliography** offers a comprehensive list of research and policy documents relating to the development of wind energy and includes resources which are particularly relevant to each of the GLWC’s workgroups.

Research and Policy Development

As a regional stakeholder organization, the GLWC is uniquely positioned to facilitate and/or conduct research and identify policies which advance sustainable development of wind power throughout the Great Lakes region.

The GLWC’s research and policy development efforts include:

- **Guidance Documents**

GLWC stakeholders are usually the “decisionmakers” within their jurisdictions and sectors and are best suited to inform their colleagues of the issues and impacts that need to be taken into account to ensure wind development occurs in a responsible, sustainable manner. In October of 2009, the GLWC released *Offshore Siting Principles and Guidelines for Wind Development on the Great Lakes* which was created through a collaborative effort by members of the Offshore Wind Workgroup and Steering Committee to promote more informed decisionmaking. The document provides guidance to federal and state regulators, as well as developers, about potential environmental and other regulatory considerations that might be of concern with an offshore wind project.

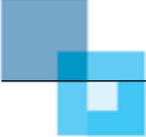
- **Surveys, Policy Assessments, and Analyses**

The GLWC is actively engaged in conducting assessments of existing sectors and policies to determine strengths and weaknesses and areas of potential growth. In 2009, the GLWC surveyed Great Lakes ports regarding their capacity to handle wind turbine components. The information gathered through this survey was used to develop: *Great Lakes-St. Lawrence*

Seaway Ports and Their Role in the Wind Industry (2010). The GLWC is also conducting an analysis of state, provincial and local policies and practices to identify those “best practices” in advancing sustainable wind development in the Great Lakes region (See insert below).

- **Research Oversight**

In addition to research on existing policies and practices, the GLWC is also engaged in researching and developing novel methods to deal with issues raised by the development of wind energy in the region. For example, masters students from the University of Michigan have teamed with the GLWC Offshore and Regional Transmission workgroups to study transmission options for connecting offshore wind energy to the existing transmission grid. Similarly, students at the University of Buffalo Law School engaged with the Offshore Workgroup to study the water dependency aspects of developing offshore wind power on the Great Lakes.



Special Initiative: Best Practices Project

<http://www.glc.org/energy/wind/bestpractices.html>

The Best Practices project identifies existing state, provincial and local policies and practices that are contributing most to advancing sustainable wind development in the Great Lakes region, and highlights opportunities for building on those already in place. The “best” policies and practices identified will be featured through an online toolbox, factsheets and briefings to Great Lakes decisionmakers.

Education and Outreach

The GLWC is committed to increasing stakeholder knowledge and understanding of the various benefits and impacts of wind development to ensure wind development occurs in an environmentally, economically and socially sound manner. Through GLWC education and outreach efforts, stakeholders are provided direct access to the latest information and research concerning wind energy in the Great Lakes region.

The GLWC’s education and outreach efforts include:

- **Symposia, Workshops and Webinars**

GLWC symposia, workshops and webinars provide stakeholders with the opportunity to learn about current research and policy from the responsible individuals and organizations. Symposia and workshops offer stakeholders a forum for meeting in person allowing the conversation to continue beyond the presentations. Webinars provide online forums that enable stakeholders to maximize their resources for learning and discussion.

Past symposia, workshops and webinars have included the following topics:

- Regional Collaboration for the Advancement of Offshore Wind Energy in the Great Lakes;
- Economic Development Aspects of Wind Energy;
- U.S. Fish and Wildlife’s Wind Turbine Guidelines;
- U.S. Department of Energy’s Eastern Wind Integration and Transmission Study (EWITS); and
- National Renewable Energy Laboratory’s Jobs and Economic Development Impacts (JEDI) Model;

- **Background Papers**

Background papers provide stakeholders with a summary of research and/or policy on topics of particular interest or importance. GLWC background papers (available on the GLWC website) include:

- *Offshore Wind Farm Regulation in the Great Lakes* (August 2008);
- *Preparation for Offshore Wind in Lake Michigan: Information Solicitation Options for Michigan and Wisconsin* (August 2009);
- *State and Provincial Land-Based Wind Farm Siting Policy in the Great Lakes Region* (Fall 2009);
- *Water Dependent Uses and Great Lakes Offshore Wind Under the Laws of New York State* (February 2010, Environment and Development Clinic, University at Buffalo Law School for the GLWC);
- *Wind Turbines in the Great Lakes: Water Dependency and Federal Regulations* (February 2010, Environment and Development Clinic, University at Buffalo Law School for the GLWC);
- *The Public Trust Doctrine and Offshore Wind in the Great Lakes* (May 2010, Environment and Development Clinic, University at Buffalo Law School for the GLWC); and
- *Wind Farm Siting and Cumulative Impact Analysis in the Great Lakes* (May 2010, Environment and Development Clinic, University at Buffalo Law School for the GLWC)

Facilitation and Consensus Building

The GLWC is actively engaged in facilitation and consensus building efforts throughout the region in order to promote greater collaboration and consistency among wind stakeholders.

GLWC efforts at facilitation and consensus building include:

- **Discussion Workshops**

In person and remote discussion workshops bring interested stakeholders to “one table” for an elevated discussion on a particular topic of importance. Such workshops often provide the basis for development of GLWC background papers, assessments and other products that reflect the consensus views of the GLWC membership. Discussion workshops facilitate open and transparent information sharing to promote the sustainable advancement of the wind energy in the Great Lakes region.

- **Regional Coordination**

Federal agencies play a significant role in guiding the development of wind energy research and regulating the wind energy industry. The GLWC’s facilitation and consensus building efforts connect regional stakeholders with the work of federal agencies to help streamline the regulatory process and facilitate a regional dialogue on federal research and guidelines.



Special Initiative: United States Council of Environmental Quality Great Lakes Offshore Wind Permitting Workshop

In 2010, the GLWC assisted the U.S. Council of Environmental Quality in organizing an offshore wind permitting workshop for U.S. and Canadian federal agencies, state regulators, local officials, environmental groups, developers, and electric utilities. Workshop participants used details from proposed offshore Great Lakes projects to analyze the existing federal and state permitting regimes for their strengths and weaknesses and identified areas of potential improvement.



This single 1.8 MW wind turbine is located at the Pickering Nuclear Generation Station on the north shore of Lake Ontario in Pickering, Ontario, Canada. Photo © Tai Viinikka.

In particular, the Siting and Permitting Workgroup facilitates discussion on the U.S. Fish and Wildlife Service guidelines paving the way for states to identify means of implementing the guidelines in their own jurisdiction and opening the door to further discussions on methods of achieving regional consistency. The GLWC Economic Development Workgroup connects state agencies and academic organizations with the National Renewable Energy Laboratory (NREL) to conduct economic development impact analyses for their respective jurisdictions.

The Future of the GLWC

It is the commitment and interest of the stakeholders in the Great Lakes region that has made the advancement of wind energy possible. The GLWC has supported and will continue to support information sharing, education, regional collaboration, research and policy development to facilitate the development of forward-thinking policies and advancement of sustainable wind energy in the binational Great Lakes-St. Lawrence Region.

Through the GLWC annual workplan, stakeholders identify those projects where the GLWC is uniquely positioned to contribute to regional efforts. The annual workplan can be found online at www.glc.org/energy.wind. Some of the future projects stakeholders have identified include:

- Analyzing federal policy and economic development impacts of moving wind supply chain cargo through the Great Lakes and St. Lawrence Seaway System;
- Conducting public perception studies to assess existing attitudes and public education needs for offshore wind development in the Great Lakes;
- Developing a best practices guidance document for Great Lakes offshore wind;
- Identifying and facilitating research needed to study conditions that relate to siting offshore wind power facilities;
- Enhancing regional access to GIS data related to wind development opportunities, environmental sensitivities and other regulatory issues; and
- Summarizing models related to cost allocation and recovery for new transmission applicable to the Great Lakes region and developing information on the different approaches to cost allocation/recovery and their impacts as they relate to the region.

The Great Lakes Wind Collaborative welcomes the participation and input of all stakeholders interested in the advancement of sustainable wind energy in the Great Lakes region. For more information about the GLWC and its activities, please contact Victoria Pebbles (vpebbles@glc.org), John Hummer (jhummer@glc.org) or Becky Pearson (bpearson@glc.org) at 734-971-9135.

Great Lakes Wind Collaborative Steering Committee

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U.S. Army Corps of Engineers

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U.S. Department of Agriculture

Tony Logan

U.S. Department of Energy

Larry Flowers

Michele Desautels (Alt.)

U.S. Department of the Interior: Fish and Wildlife Service

Jeff Gosse

Bob Krska (Alt.)

U.S. Environmental Protection Agency: Great Lakes National Program Office

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National Oceanic and Atmospheric Administration

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Travis Murphy, *Indiana Office of Energy & Defense Development*

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Marvin Pelletier (Alt.), *mPower North*
Rebecca Jamieson (Alt.), *First Nations Technical Institute*

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Dave Ullrich, *Great Lakes and St. Lawrence Cities Initiative*

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Susan Sloan (Alt.), *American Wind Energy Association*
Jennifer Alvarado, *Great Lakes Renewable Energy Association*
Mark Sinclair, *Clean Energy States Alliance*

Environmental and Conservation Not-For-Profit Organizations

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Mike Layton, *Environmental Defence*
Jennifer Nalbone (Alt.), *Great Lakes United*
Michael Murray, *National Wildlife Federation - Great Lakes Natural Resource Center*
Frank Szollosi (Alt.), *National Wildlife Federation - Great Lakes Natural Resource Center*
Emily Green, *Sierra Club - Great Lakes Program*

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Joyce McLean, *Toronto Hydro Corporation*

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Steve Rice, *JFNew*

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Abby Arnold, *Kearns West*
John Gannon, *International Joint Commission*

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