



Acknowledgement:



[Operating Small Wind Generating Facilities Installed in Wisconsin After Passage of 2005 Act 141 \(\$\geq 10\$ kW \$\leq 300\$ kW\) 3/17/06 – 3/31/11](#)

This toolbox set was assembled and provided by Mick Sagrillo of Sagrillo Power & Light. Many of the fact sheets were authored by Mick over many years for publication in other venues.

Although some of the materials are Wisconsin-specific, we hope that this toolbox will be of assistance to anyone planning to install a wind turbine for their own use.

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Small Wind Toolbox

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Documents are in Adobe PDF Format and will require [Acrobat Reader](#)

Toolbox--Information for Homeowners and Installers

- ▶ [A Call for a Sensibility Approach to Small Wind](#)
- ▶ [An Open Letter to Inventors](#)
- ▶ [Annual inspections](#)
- ▶ [Apples & Oranges](#)
- ▶ [Apples & Oranges Technical Appendix](#)
- ▶ [Back to the Basics 1-Ground Drag](#)
- ▶ [Back to the Basics 2-Turbulence](#)
- ▶ [Back to the Basics 3-Quality Plus Quantity Equals More Electricity](#)
- ▶ [Back to the Basics 4-Determining Your Minimum Tower Height](#)
- ▶ [Back to the Basics 5-Collector Size](#)
- ▶ [Back to the Basics 6-Estimating Annual Energy Output](#)
- ▶ [Buying used equipment](#)
- ▶ [Caveat Emptor](#)
- ▶ [Code compliance](#)
- ▶ [Determining the Cost of Electricity](#)
- ▶ [Environmental Benefits of Your Wind Energy System](#)
- ▶ [Home-built wind generators](#)
- ▶ [How to Buy a Wind Energy System \(921KB\)](#)
- ▶ [How to Buy a Wind Energy System, with WI Wind Map \(3MB\)](#)
- ▶ [How to Buy a Wind Energy System, updated 2009](#)
- ▶ **New !** [Wind Turbine Buyers Guide, 2011 - includes installer survey](#)
- ▶ [Installing your own wind system](#)
- ▶ [Filing an insurance claim](#)
- ▶ [Keep it spinning](#)
- ▶ [Operation and maintenance costs](#)
- ▶ [Payback 1- The Wrong Question](#)
- ▶ [Payback 2- Investment Considerations for Small Wind](#)
- ▶ [Planning Your Wind System 1-What Size System Do You Need](#)
- ▶ [Planning Your Wind System 2-Evaluating Your Wind Resource](#)
- ▶ [Planning Your Wind System 3-Improving Your Site](#)
- ▶ [Planning Your Wind System 4-Building Permits](#)
- ▶ [Planning Your Wind System 5-Utility Requirements](#)
- ▶ [Planning Your Wind System 6-Liability Insurance](#)
- ▶ [Planning Your Wind System 7-Homeowner's Insurance](#)
- ▶ [Planning Your Wind System 8-Finding an Installer](#)

- ▶ [Planning Your Wind System 9-Utility Buy-Back Rates](#)
- ▶ [Planning Your Wind System 10-Working With Your Neighbors](#)
- ▶ [Problem Wind Systems Hit North America](#)
- ▶ [Questions Any Installer Should Answer](#)
- ▶ [Questions Any Manufacturers Should Answer](#)
- ▶ [Rooftop Wind--Determining Your Resource](#)
- ▶ [Rooftop-Mounted Wind Turbines](#)
- ▶ [Rules of thumb for tower heights](#)
- ▶ [Silver Lining in Poorly Performing Turbines](#)
- ▶ [Size Matters](#)
- ▶ [Small wind systems WI consumers guide](#)
- ▶ [Tower styles](#)
- ▶ [Towers 1—Siting towers and heights for small wind turbines](#)
- ▶ [Towers 2—Considerations for wind turbine towers](#)
- ▶ [Towers 3—Tower height versus power](#)
- ▶ [Towers 4—Tower cost versus power](#)
- ▶ [Towers 5—Tall tower economics](#)
- ▶ [Urban Turbines and Kinetic Architecture-Just What Are We Demonstrating?](#)
- ▶ [Vertical axis wind turbine myths](#)
- ▶ [Warwick Urban Wind Trial Project](#)
- ▶ [What You Need To Understand About a Wind Turbine for Your Home](#)
- ▶ [Wind Turbine Buyers Guide - 2007](#)
- ▶ [Zoning 1--Trials and tribulations](#)
- ▶ [Zoning 2--Keeping hearings under control](#)
- ▶ [Zoning 3--Zoning obstacles](#)
- ▶ [Zoning 4--Perceptions and local concerns](#)
- ▶ [Zoning 5--Barriers to small wind systems](#)
- ▶ [Zoning 6--Protecting your right](#)
- ▶ [Zoning for Distributed Wind--J. Green and M. Sagrillo](#)

Toolbox--Fact Sheets for Zoning Hearings

- ▶ [Abandonment](#)
- ▶ [Aesthetics](#)
- ▶ [Assessment of Risk Due To Ice](#)
- ▶ [Bats](#)
- ▶ **Birds**
 - ▶ [Small Turbines and Birds](#)
 - ▶ [Wind Turbines and Birds](#) - Focus on Energy Factsheet
 - ▶ [Bird Mortality by Percentage Histogram](#)
 - ▶ [A Study of Bird and Bat Mortality at Orion Energy Systems During the 2010 Fall Migration - Manitowoc, WI](#)
 - ▶ [Wisconsin DNR Letter -- Position on Small Wind Turbines](#)
 - ▶ [Wisconsin DNR Letter for Shawano Small Turbine Permit -- Wind Turbines and Wildlife](#)
 - ▶ **Bird Mortality Studies - Small Wind Turbine Research & Demonstration Site on Beech Mountain, NC**
 - ▶ [Beech Mountain Wind Farm Carcass Monitoring Method](#)
 - ▶ [Carcass Monitoring Report - Migration Spring 2005](#)
 - ▶ [Carcass Monitoring Report - Migration Fall 2005](#)
- ▶ [Epilepsy and Other Such Ruses](#)
- ▶ [FAA](#)
- ▶ [Fences](#)
- ▶ [Ice shedding](#)
- ▶ [Why Wind Turbines can Spin but not Throw Ice](#)
- ▶ [Lightning](#)
- ▶ [Sound](#)
- ▶ [Net metering and zoning](#)
- ▶ [Payback](#)

- ▶ [Property values](#)
- ▶ [Setbacks](#)
- ▶ [Shadow flicker and strobing](#)
- ▶ [Small Rooftop Wind Turbines](#)
- ▶ [Stray voltage](#)
- ▶ [Tower engineering for building permits](#)
- ▶ [Tower heights and zoning hearings](#)
- ▶ [Tower Styles](#)
- ▶ [TV and communications interference](#)
- ▶ [Visibility](#)

- ▶ [Focus on Energy Fact Sheets/Case Studies](#)

- Using wind energy: small-scale systems
- Wind turbines and birds: Putting the situation in perspective in WI
- Doing Business with Wind Energy
- Owning a PV/Wind Hybrid System: Being Your -Own Utility

Tool box--Zoning and Permitting

- ▶ [Small Wind System Model Ordinance -- Version 12-06](#)
- ▶ [Small vs Large Wind Graphic](#)
- ▶ [Wisconsin DNR Letter -- Position on Small Wind Turbines](#)
- ▶ [Wisconsin DNR Letter for Shawano Small Turbine Permit -- Wind Turbines and Wildlife](#)

Turbines and towers funded by Focus on Energy

- ▶ [Installed as of June 9, 2009](#)
- ▶ [In progress as of June 9, 2009](#)

Toolbox - Wisconsin Specific Information

Applications and Forms

FAA

- ▶ [7460-1 Application Form](#)
- ▶ [Instructions for 7460-1](#)
- ▶ [Notice Instructions](#)

Wisconsin - Interconnection

- ▶ [Application Flow Chart in WI Interconnection Guidelines](#)
- ▶ [Introduction to Distributed Generation](#)
- ▶ [PSC 119 Rules for Interconnection](#)
- ▶ [PSC 6027-Application Form for up to 20 kW](#)
- ▶ [PSC 6028-Application Form for 20 kW to 15 MW](#)
- ▶ [PSC 6029-Agreement Form for up to 20kW](#)
- ▶ [PSC 6030-Agreement Form for 20 kW to 15 MW](#)
- ▶ [Utility Data Release Form](#)
- ▶ [Utility Designated Points of Contact for Interconnection](#)
- ▶ [Wisconsin Interconnection Guidelines-April, 2004](#)

Wisconsin Electrical Codes

- ▶ [Department of Commerce Chapter 16](#)
- ▶ [PSC 113-Service Rules for Electric Utilities](#)
- ▶ [PSC 114-Wisconsin State Electric Code](#)

Wisconsin - Funding Opportunities

Focus on Energy Program

- ▶ [Program Services for eligible customers of participating electric and natural gas utilities](#) (includes incentives toward installation of wind energy equipment)
- ▶ [Incentives in Wisconsin](#)

USDA Section Rural Energy for America Program (REAP) - Energy Efficiency & Renewable Energy Funding For Farms and Rural Small Businesses

- ▶ [Grants & Loan Guarantee Overview](#)
[U. S. Dept. of Agriculture -- Rural Development Website](#)
- ▶ [U.S. Dept. of Agriculture -- Wisconsin Rural Development Website](#)

Wisconsin - Legal

- ▶ [Letter from Assistant Attorney Gen Blythe to Town of Byron \(on 66.0401\)](#)
- ▶ [UW-Extension letter on the small wind zoning ordinance](#)
- ▶ [WI State Statute 66.0401](#)
- ▶ [WI State Statute 70.111](#)
- ▶ [WI State Statute 236.292](#)

Wisconsin - Zoning

- ▶ [WI State Statute 66.0401](#)
- ▶ [Appeals Court Decision on Mequon](#)
- ▶ [FERC Enforces PURPA in Iowa](#)
- ▶ [FERC Upholds Net Metering Law](#)
- ▶ [Letter from Attny General Lautenschlauger \(on 66.0401\)](#)
- ▶ [Letter from Assis Attny General to Town of Byron \(on 66.0401\)](#)
- ▶ [Letter to Doyle \(on 66.0401\)](#)
- ▶ [ST. Croix Falls Circuit Court Decision](#)
- ▶ [Supreme Court Refusal to Hear Mequon Case](#)
- ▶ [WI Renewables Statute Table](#)

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