



WINDEMULLER RENEWABLE ENERGY

“Gamesa has had the opportunity to work with several different electrical contractors over the last few years. Windemuller’s willingness to heed advice and prepare for their site activities was a prime example of teamwork in the wind industry. The performance of you and your crew during installation of this G97 unit here in Garden, Michigan was well above exceptional and personally for Gamesa some of the best electrical work we have witnessed in our machines. Congratulations to you and your team for a job very well done. Gamesa looks forward to working with Windemuller again on the next 13 units and building a very successful site.”

– Frank Ingraham
*Construction Manager
Gamesa Wind US
Garden, Michigan*



WINDEMULLER

Partners in your success





ABOUT WINDEMULLER

Windemuller provides advanced technical and design services throughout Michigan and beyond. The family-owned company was established in 1954 as an electrical contractor, but has expanded into automation, communications and IT, electrical services, outdoor utilities, and renewable energy. From security systems for the government, to gauges and automated sensors for environmental cleanups, to responding to emergencies

on an industrial site, we are responsive and innovative. At its heart, Windemuller is about our people and the people we serve. We are more than 200 individuals strong and serve thousands of customers of all sizes within industrial, government, municipal, and commercial entities.

Windemuller has six Michigan locations: Grand Rapids, Traverse City, Big Rapids, Whitehall, Petoskey and Kalamazoo.

AUTOMATION

- PLC and Database Programming
- HMI / SCADA Programming
- Custom Panel Building Shop (UL 508A, UL 698A)
- Process and System Controls Engineering
- Wireless Communications (Wireless Telemetry)
- Instrument Calibrations
- Windows Software Development
- Web Application Development
- App Development (Android, iPhone)

COMMUNICATIONS & IT

- Structured Cabling Systems
- Fiber Optic Systems
- Access Control
- Video Security
- Telephone Systems
- IT Network Service and Support
- Design and Engineering

ELECTRICAL

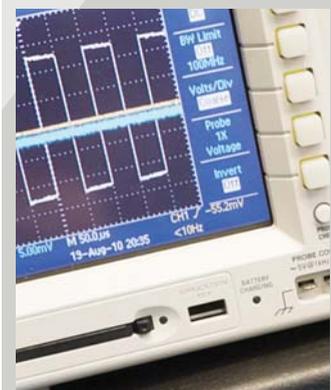
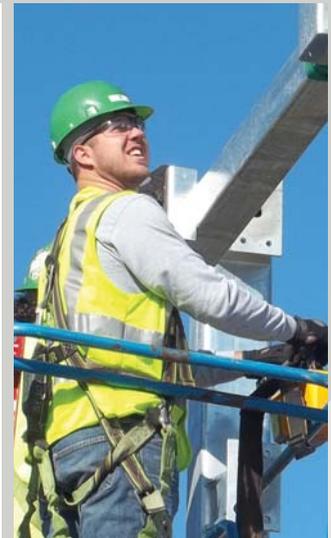
- Design-Build
- Industrial Installations
- Commercial Installations
- Preventive Maintenance Partnerships
- Building Information Modeling (BIM)
- Lighting Protection
- Lighting Retrofits/Upgrades
- Billboard Maintenance
- Electrical Engineering
- Generator Installation
- Energy Efficiency Upgrades

OUTDOOR UTILITIES

- Sports Field Lighting
- General Site and Parking Lot Lighting
- Medium Voltage Overhead Distribution
- Medium Voltage Underground Distribution
- Medium and High Voltage Substations
- Traffic Signal Construction and Maintenance
- Distribution System Maintenance
- Airport Runway Construction and Maintenance
- Transformer Oil Testing and Maintenance

RENEWABLE ENERGY

- Utility Scale Wind Systems
- Commercial Scale Wind Systems
- Utility Scale PV Solar Systems
- Commercial Scale PV Solar Systems
- Interconnection Substations
- Wind and Solar Plants Operations and Maintenance.





SAFETY

RENEWABLE ENERGY DIVISION SAFETY DATA

	2011	2010	2009	2008
EMR Rating	.65	.65	.58	.58
OSHA Lost Work Day Rate	0	0	0	0
OSHA Recordable Rate	0	0	0	0
Man Hours Worked	13,236.25	14,097.75	4,740.50	2,961.50

TRAINING

At Windemuller, we consider safety to be our number one priority. We require each new employee to undergo a regiment of safety training courses, from first aid, to fire safety, to working in specific, stressful construction environments, assigned on an individual basis depending on the worker's job function in the company. In addition, every worker must participate in ongoing safety education, with six courses required each year beyond the introductory materials. These requirements have helped Windemuller greatly in its goals of eliminating the causes of all workplace injuries, providing a safe work environment with no potential of injury, and abiding by all regulations set forth by federal, state, and local standards.

Windemuller has been praised for its ongoing commitment to safety and workplace awareness, receiving an average EMR safety rating of .61 over the past five years, and inspiring Edward Berends (of Berends, Hendricks, Stuit Insurance Agency) to declare, "The high priority you have placed on workplace safety and the investment you have made in employee safety education have had a major influence in the low frequency and severity of workers compensation incidents."

With our efforts redoubled and our commitment to our employee's well-being as strong and pronounced as ever, we only hope to see our number of workplace accidents decrease in the years to come.

COMMON REQUIRED COURSES

- Aerial Lift Safety - Construction
- Asbestos Awareness
- Confined Space - Construction
- Construction Safety Orientation
- Electrical Safety
- Fire Safety
- First Aid
- Hazard Communications
- Lock-out/Tag-out
- Personal Protective Equipment

Our team has achieved certifications as Wind Energy Competent Rescuers - 2 Day 16 Hour, meeting the fall protections training requirements of OSHA, ANSI and CSA.

WINDEMULLER SAFETY DATA

	2011	2010	2009	2008	2007
EMR Rating	.65	.65	.58	.58	.58
OSHA Lost Work Day Rate	0	1.07	1.09	.99	0
OSHA Recordable Rate	2.28	4.3	5.45	3.95	.95
Man Hours Worked	351,615	372,359	366,969	404,601	422,812
Number of Employees	180	185	186	198	203



RENEWABLE ENERGY: WIND FARM CONSTRUCTION

Windemuller's utility scale wind farm experience began back in 2000, with the installation of two 1MW NEG Micon wind turbines in Mackinaw City, Michigan. This project, while small compared to today's projects, allowed us to pioneer new skills and become experts in wind energy electrical balance-of-plant design. Since then, we have been the electrical balance-of-plant-design and build contractor on projects such as the 60MW Stoney Corners Wind Farm and the 100MW Garden Wind Farm.

Our design-build roles are to facilitate the interconnection agreement with the utility company and to design and install the substation, collection system, foundation conduit, foundation grounding, fiber communications and SCADA system, weather station installation, and tower wiring. Our wind turbine tower wiring experience includes Vestas, NEG Micon, Furhlander, Repower, Northern Power, and Gamesa. We also install and commission MET towers.

Windemuller's expert design and construction professionals are able to help take your renewable energy project from concept through construction and into operation.

CONCEPT

Our trusted ability to study, negotiate and determine the optimal availability of transmission infrastructure is key for site selection and layout.

CONSTRUCTION

We have the unique in-house capability to design and install the complete electrical, communication, control and collection systems. Utility Interconnection, Transmission Lines, Substations, Tower Wiring and Fiber Optic SCADA Systems.

OPERATION

Our reliable operation and maintenance technicians are trained and experienced to safely perform a full range of component repair and maintenance.





RENEWABLE ENERGY: WIND FARM MAINTENANCE

Windemuller's renewable energy maintenance experience includes electrical balance-of-plant and wind turbine maintenance. Electrical balance-of-plant maintenance covers substation repairs, collection system cable testing, transformer oil testing, infrared surveys, and arc-flash studies and labeling.

Our wind turbine maintenance experience includes

yaw motor replacement, main-gear replacement (including rigging), converter component replacement, tower lighting replacement, FAA light troubleshooting and replacement, and primary switch replacement. Our crews have specialized tower climbing and rescue training, and we can attain specific manufacturer component certifications if required.

Our inspection, maintenance and reporting services for your turbines can include:

- General Cleanliness
- Safety Tower Lighting (FAA)
- Infrared Scans
- Oil Testing
- Voltage Testing
- Elevator Operation
- Elevator Cable
- Power/Communications Cable Twist
- Yaw Gear
- Yaw Brakes
- Transformers
- Control Cabinet
- Converter System
- Generator
- Gear Box
- Coolant System
- Wiring, Connections
- Lubrication
- Nacelle Housing
- Weather Stations
- Hoist Operations
- Pitch System Components
- Lightning Damage
- Fire Extinguishers

Additional services include:

- Megger Testing
- Hi-Pot Testing
- Lightning System Testing
- Root Cause Investigation
- Feasibility Studies
- Siting Studies
- Custom Reporting

Other Renewable Energy Services:

- Utility Scale Wind Systems
- Commercial Scale Wind Systems
- Utility Scale PV Solar Systems
- Commercial Scale PV Solar Systems
- Interconnection Substations
- Wind and Solar Plants Operations and Maintenance





RENEWABLE ENERGY: UTILITY SCALE PROJECTS

STONEY CORNERS WIND FARM

- Location: McBain, Michigan
- Contract Size: Phase 1 = \$3,440,000, Phase 2 = \$3,700,000, Phase 3 = \$2,223,600
- Completion Date: Phase 1 – 2009, Phase 2 – 2010, Phase 3 – 2011

Completed in three phases over three years, the Stoney Corners Wind Farm project was one of the most expansive in Windemuller's history.

Phase 1 involved the installation of two 2.5 megawatt Fuhrlaender turbine generators on 100 meter towers and seven 2.0 megawatt Repower turbine generators on 80 meter towers. The total wind farm electric generation capacity after phase 1 construction was 19MW, with these 475-foot turbines designed to generate energy to roughly 1,400 to 1,600 homes. The majority of this renewable energy is being sold to the Detroit Edison under a 20-year power purchase agreement.

Windemuller designed and built the entire electrical balance of the plant, including installing over 17 miles of 34.5 kilovolts direct burial primary cable and single mode fiber optic cable; installation included 5 road bores and three high pressure gas line crossings. A 20 megawatt substation was also built to step the voltage from 34.5 kilovolts to 69 kilovolts for interconnection to the utility.

Phase 2 saw an addition ten 2.0 megawatt Repower MM92 wind turbine generators being installed to expand the capacity of the plant. Windemuller designed and installed the collection system, as well as a 40 MW substation adjacent to the existing 20MW substation. Windemuller also set up the routers and communication systems to transmit meter data to the multiple power purchasers.

Phase 3 completed the Stoney Corners Wind Farm project with the installation of an additional nine 2.0MW wind turbine generators, seven Repower MM92 machines, and two Northern Power 2.2 MW permanent magnet prototype machines. These final additions brought the plant to a full capacity of 60 megawatts.





cont'd

RENEWABLE ENERGY: UTILITY SCALE PROJECTS

GARDEN WIND PROJECT

- Location: Garden, Michigan
- Contract Size: \$8,200,000 million
- Completion Date: 2012

Windemuller's Garden Wind Power project, located on Garden Peninsula between Manistique and Escanaba in Michigan's Upper Peninsula, consists of a 10 miles, 138kV transmission line, 70MW substation, and 14 2-Megawatt Gamesa G97 Wind turbines. Our team designed and installed the transmission line, substation, collection system and tower wiring, and SCADA System.

Power from the project is currently being purchased by DTE Energy and Consumers Energy, and the system is being interconnected to ATC.





cont'd

RENEWABLE ENERGY: UTILITY SCALE PROJECTS

MACKINAW WIND PROJECT

- Location: Mackinaw City, Michigan
- Contract Size: \$150,000
- Completion Date: 2001

Located on Mackinaw City's waste water plant, this project was comprised of two wind turbine generators, each standing at 230 feet high with three 85-foot blades. Windemuller's team designed and installed the primary distribution system for the 5MW wind farm, but only 2MW of power were installed. These were the first utility scale wind turbines ever installed in the state of Michigan.





RENEWABLE ENERGY: SMALL SCALE PROJECTS

BURT TOWNSHIP SCHOOLS

- Location: Grand Marais, Michigan
- Project Size: 1.5kW PV Awning, 2.4 kW Wind Turbine
- Date of Installation: June 2010
- Equipment Installed: SMA 3000US inverter, REC 230 PV panels, custom

awning structure (designed by Windemuller), Davis weather station, connection to internet via Powerdash components. 2.4kW Skystream Wind Turbine.

- Connected to Alger-Delta System.



ALMA MIDDLE SCHOOL

- Location: Alma, Michigan
- Project Size: 2.2. kW PV Pavilion, 2.4 kW Wind Turbine
- Date of Installation: December 2010
- Equipment Installed: SMA 3000US inverter, REC 230 PV panels, custom pavilion structure (designed by

Windemuller), Davis weather station, connection to internet via Powerdash components, 2.4kW Skystream Wind Turbine.

- Connected to Consumers Energy System



HUDSONVILLE HIGH SCHOOL

- Location: Hudsonville, Michigan
- Project Size: 1kW PV Awning, 2.4kW Wind Turbine
- Date of Installation: September 2010
- Equipment Installed: SMA 3000US inverter, REC 230 PV panels, custom awning structure (designed by

Windemuller), Davis weather station, connection to internet via Powerdash components. 2.4kW Skystream Wind Turbine

- Connected to Consumers Energy system



STEENLAND ELEMENTARY SCHOOL

- Location: Roseville, Michigan
- Project Size: 1kW PV Pavilion and 2.4kW Skystream Wind Turbine
- Date of Installation: December 2010
- Equipment Installed: SMA 3000US inverter, REC 230 PV panels, custom

pavilion (designed by Windemuller), Davis weather station, connection to internet via Powerdash components, 2.4 kW Skystream Wind Turbine.

- Connected to DTE Energy system



ONSTEAD HIGH SCHOOL

- Location: Onsted, Michigan
- Project Size: 1kW PV Awning, 2.4 kW Wind Turbine
- Date of Installation: November 2010
- Equipment Installed: SMA 3000US inverter, REC 230 PV panels, custom

awning (designed by Windemuller), Davis weather station, connection to internet via Powerdash components, 2.4 kW Skystream Wind Turbine.

- Connected to Consumers Energy System

