

Wind Industry in West Michigan: Prepare for Market Share

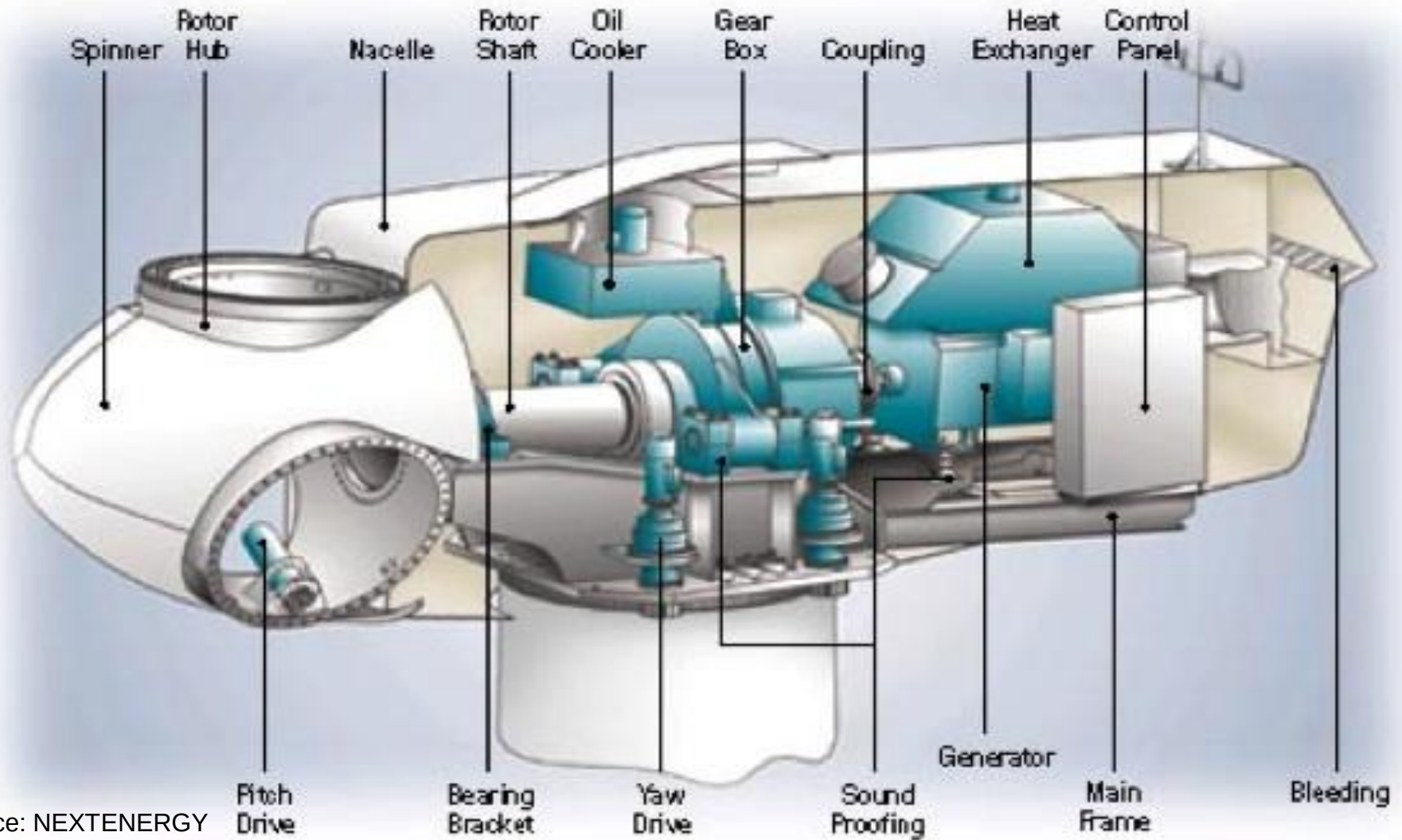


smart energy. clean energy. today's energy.™





There are approximately 8,000 components in a wind turbine design





Turbine Components

Towers:

Towers
Ladders
Lifts

Rotor:

Hub
Nose Cone
Blades

- Composites
- Blade Core

Pitch Mechanisms
Drives
Brakes
Rotary Union

Nacelle:

Nacelle Cover
Nacelle Base
Heat exchanger
Controllers
Generator
Power
Electronics
Lubricants
Filtration
Insulation
Gearbox
Pump
Drivetrain
Ceramics
Shaft

Foundation:

Rebar
Concrete
Casings

Other:

Transformers
Bolts/Fasteners
Wire
Paints and Coatings
Lighting
Lighting Protection
Steel Working/Machining
Communication Devices
Control and Condition Monitoring Equipment
Electrical Interface and Electrical Connection
Batteries
Bearings
Brakes



Top 10 wind turbine manufacturers by megawatts installed worldwide in 2009

- [Vestas](#) ([Denmark](#)) 35,000 MW
- [Enercon](#) ([Germany](#)) 19,000 MW
- [Gamesa](#) ([Spain](#)) 16,000 MW
- [GE Energy](#) (Germany / [United States](#)) 15,000 MW
- [Siemens](#) (Denmark / Germany) 8,800 MW
- [Suzlon](#) ([India](#)) 6,000MW
- [Nordex](#) (Germany) 5,400 MW
- [Acciona](#) (Spain) 4,300 MW
- [REpower](#) (Germany) 3,000 MW
- [Goldwind](#) ([China](#)) 2,889 MW

US turbine manufacturers

- [Aeronautica Windpower](#) (USA)
- [Cascade Wind Corp.](#) (USA)
- [Clipper Windpower](#) (USA)
- [General Electric](#) (USA)
- [Northern Power Systems](#) (USA)
- [PacWind](#) (USA)
- [Raum Energy Inc.](#) (Canada - Global supplier of 1.3kW and 3.5kW systems)
- [Southwest Windpower](#) (USA)

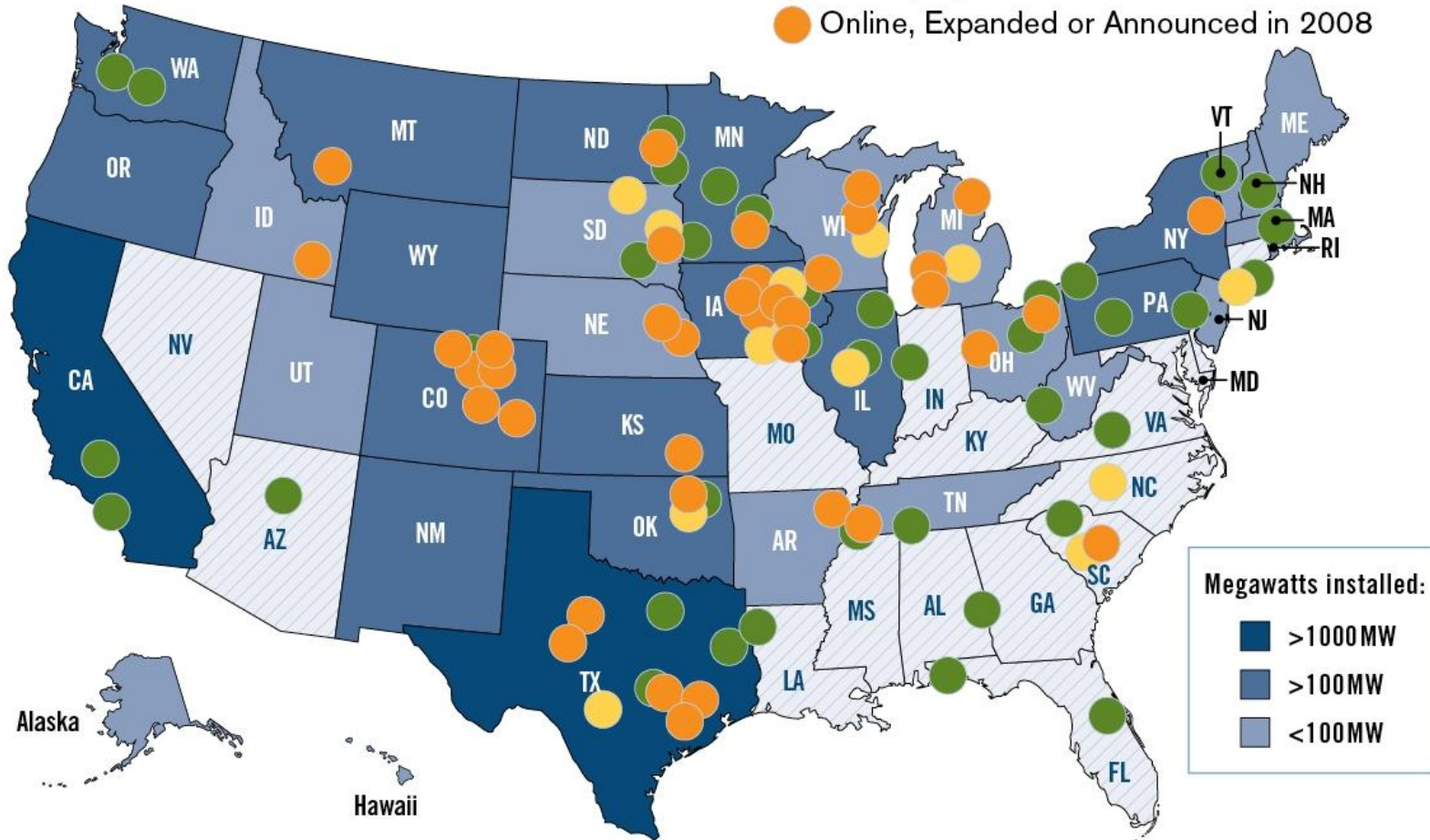


Subproviders

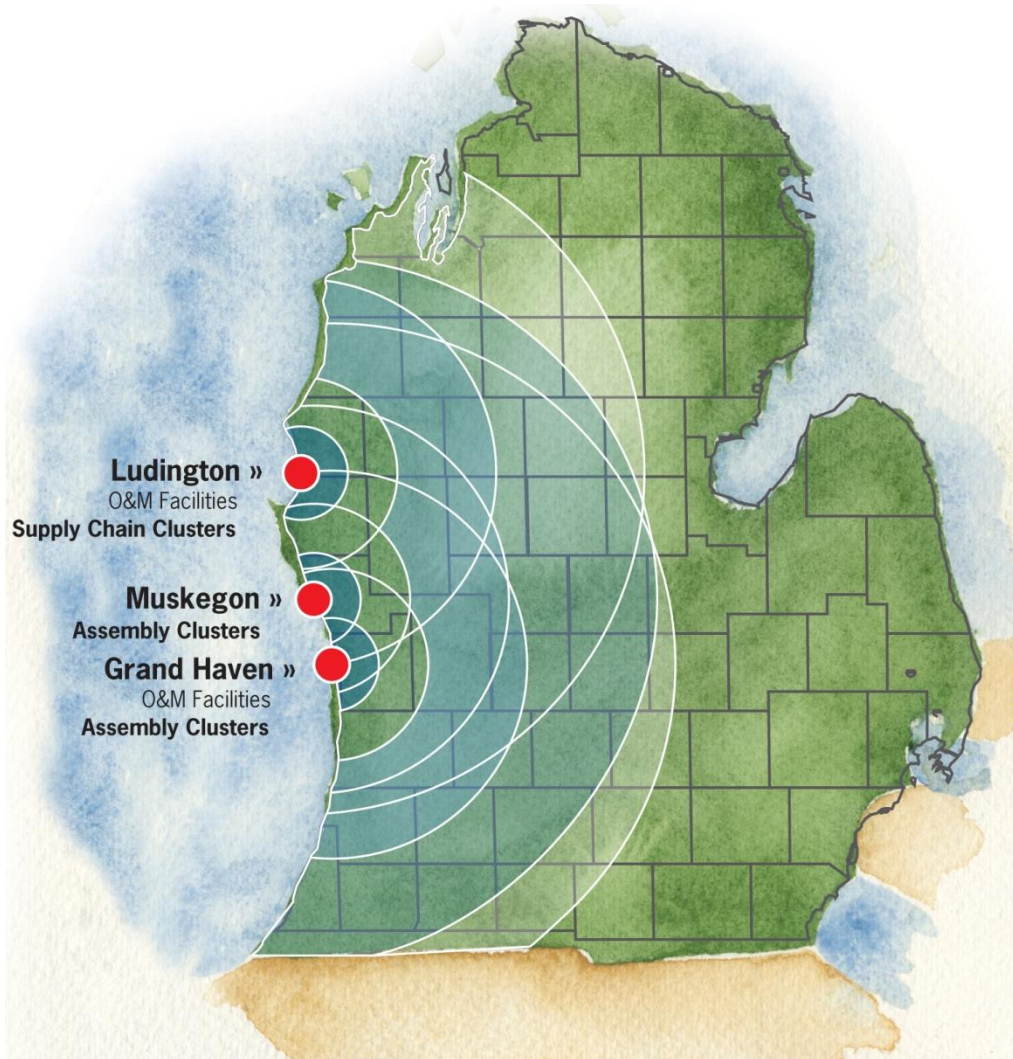
- [ABB](#) Generators, converters and power solutions
- [American Hofmann](#) Balancing machines for turbines and armatures (USA)
- [Antec](#) Specialists in wind turbine Braking Systems (Spain)
- [Bosch Rexroth](#) Gearboxes, brakes, pitch control and yaw systems for wind turbines (Germany, USA)
- [Hatch Ltd](#) Associates Leading consulting and engineering firm with a Global presence
- [Hansen Transmissions](#) Gearboxes for wind turbines (Belgium)
- [ELECON](#) Gearboxes for wind turbines (India)
- [LM Wind Power](#) Blades for wind turbines (Denmark)
- [Linak](#) Wind Turbine Automation Components (Denmark)
- [Moventas](#) Gearboxes for wind turbines (Finland)
- [PSM](#), the world's largest manufacturer of tower flange (Korea)
- [SIME Corp](#) Brake systems and limit switch controllers for yaw and pitch systems

Current Manufacturing Locations

- Online Prior to 2007
- Online, Expanded or Announced in 2007
- Online, Expanded or Announced in 2008



A vision for West Michigan



In creating industry epicenters in Ludington, Muskegon and Grand Haven, many job opportunities will be generated in West Michigan.

By succeeding attracting an OEM to Muskegon, up to 3,000 jobs could be created.

Most jobs would be in the supply chain -- creating opportunities for existing and new businesses in the region.

Market Conditions for Wind Power

European Wind Energy Assoc (EWEA) studies suggest that areas most suitable for Wind industry growth have the following characteristics:

- declining shipyards
- decreasing fishery activity
- decreasing activity in the car industry
- or the slowing down of other industries





Linking Local Business to the Wind Industry

Bring a concept into operation:

- Staff full time business developer/liaison to connect local business to the wind industry
- Involve Non-Government Organizations (NGOs)
- Engaged State of Michigan officials and agencies
- Initial funding requirement: \$200-300k



A Successful Business Model

Bring local suppliers into the wind industry:

- Systematic and analytic supplier development
- Centralized contract clearing house
- Greatest possible share of contracts to member companies
- Identify, develop and educate suppliers
- Facilitate cooperation and alliances
- Liaison between utility companies, project developers and the suppliers



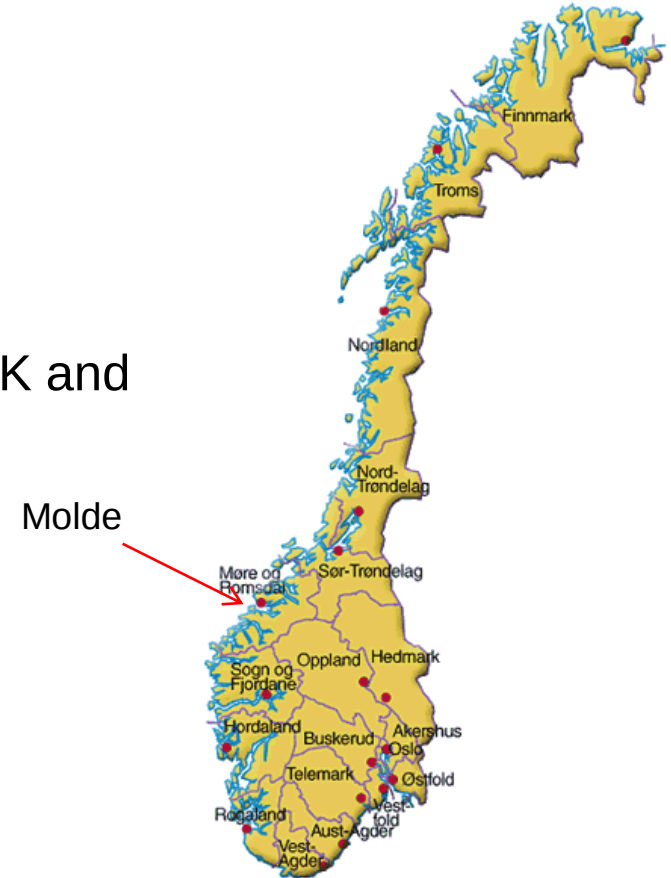
Job Description

Provide the following services:

- Workshops and conferences
- Excursions
- Cooperation with other organizations
- Advice & counseling
- Government contact
- B2B meetings

Navitas Network's Corporate Structure

- Navitas Network's Network
 - Approx. 450 member companies
 - Cooperation partners in Germany, UK and China
- An independent organization
 - "Owned" by the member companies
 - Non-profit
 - Non-political



How we work - Wind power

Branching out:

- Our goal: Building a global supplier network!
- How? 1) Establishing Navitas Network offices where our services and input is needed and wanted
2) Building strategic alliances with similar network/organizations, which lacks our experience
- What can we offer? Full business and administrative support from head office, and the insight of a network with branches in the UK, Germany and China
- What do we need? A member base and establishing partners (government and/or private)
- Start up capital: approx. 2 – 300.000 USD for a initial period of 3 – 5 years

Navitas Network History

2003: Supplier Network Ormen Lange

- The largest industrial project in Norway
- The worlds longest subsea pipeline
- Onshore plant at Aukra – 2500 inhabitants
- Total investment – approx. 12 billion USD
- Concept: Regional and local
- Business development





Results

Ormen Lange - total cost approx. 12 billion USD

- Norwegian share: 70,5 %
- Mid – Norway share: 11, 5 %
- Local share: 4,3 %
- Local and regional workplaces in project phase: 2100
- Local and regional workplaces in operational phase: 750

This is 46% better than expected!

Why?

Because systematic supplier development works! The use of local and regional suppliers saves money for the developers, and creates jobs and income for the businesses!