



WHERE PEOPLE & TECHNOLOGY PROSPER

**Oakland County
Michigan**
Emerging Sectors®

Alternative Energy & Power Generation Technology

Powering your Future



The Oakland County Alternative Energy and Power Generation Advantage

In the expanding global economy, energy sources have become major economic drivers. Alternative and clean energy, in particular, have become integral parts of the mix for future power generation.

Oakland County, as part of County Executive L. Brooks Patterson's Emerging Sectors strategy, is committed to building Alternative Energy and Power Generation industries in the county and the region.

A recent National Renewable Energy Laboratory report stated that as much as 20 percent of the power connected to the grid could come from wind by 2024. The report, "The Eastern U.S. Wind Integration and Transmission Study," is a technical review analyzing the economic, operational, and technical implications of shifting 20 percent or more of the nation's electrical load to wind energy by the year 2024. Industry experts also predict that renewable energy and energy efficiency alone will add \$4.5 trillion in value to the U.S. economy by 2030 and create millions of good-paying jobs.

Companies located in Oakland County have a strategic advantage in capitalizing on this green-energy revolution. Just look at the following features:

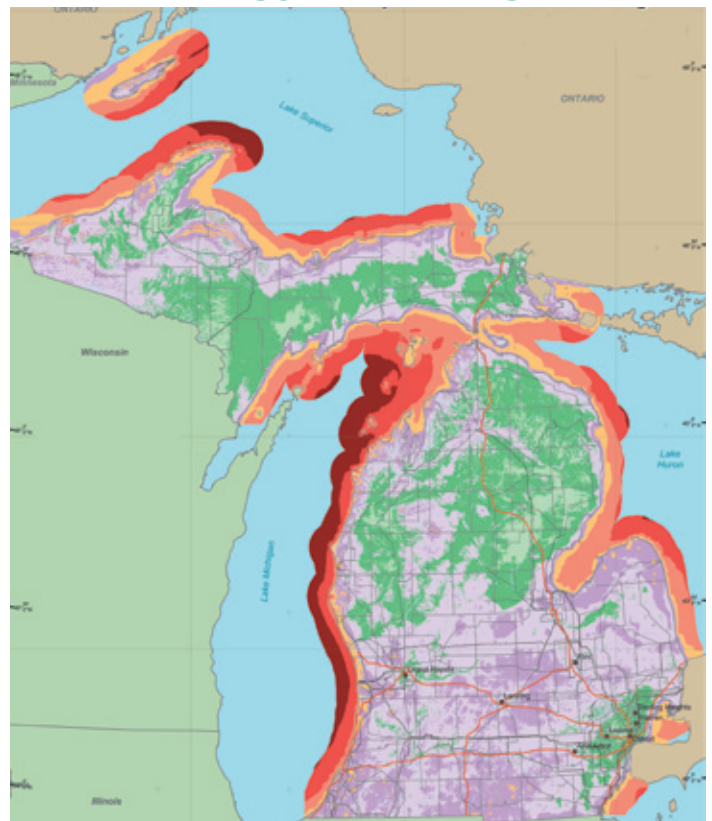
- ◆ The state's untapped wind resources offer an almost unlimited source of clean, zero-carbon electricity
- ◆ Local farm and forest land can be put to use to grow the fuels of the future
- ◆ Area universities and corporate research centers are becoming world leaders in alternative energy science
- ◆ 100 years of manufacturing expertise can build the components of the green-energy economy

Organizations To Support You:

- ◆ Automation Alley – Southeast Michigan's Regional Technology Cluster
- ◆ Center for Fuel Cell Systems & Powertrain Integration
- ◆ DTE Energy Hydrogen Research Parks
- ◆ EPA's National Vehicle & Fuel Emissions Laboratory
- ◆ Great Lakes Bio-energy Research Center (GLBRC)
- ◆ Great Lakes Renewable Energy Association
- ◆ Michigan Alternative & Renewable Energy Center (MARC)
- ◆ Michigan Agri-Business Association
- ◆ Michigan Bio-Economy Consortium
- ◆ Michigan Bio-Mass Energy Program (MBEP)
- ◆ Michigan Clean Tech Cluster

- ◆ Michigan Green
- ◆ Michigan Independent Power Producers Association
- ◆ Michigan Manufacturers Association (MMA)
- ◆ Michigan Manufacturing Technology Center (MMTC)
- ◆ Michigan Renewable Fuel Commission
- ◆ Michigan Solid State Lighting Association (MSSLA)
- ◆ Michigan's Technology Tri-Corridor
- ◆ Michigan Wind Working Group
- ◆ National Biofuel Energy Lab (NBEL)
- ◆ National Center for Manufacturing Sciences (NCMS)
- ◆ National Institute of Industrial Technology (NAIT)
- ◆ National Renewable Energy Lab
- ◆ National Vehicle & Fuel Emission Laboratory
- ◆ NextEnergy Center
- ◆ Oak Ridge National Laboratories
- ◆ Society of Manufacturing Engineers (SME)
- ◆ TARDEC's National Automotive Center (NAC)
- ◆ Toyota Research institute of North America
- ◆ U.S. Tank Automotive Research Development and Engineering Center (TARDEC)

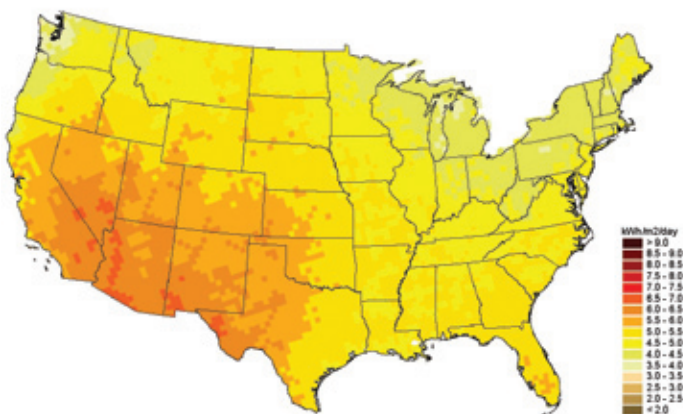
Wind Energy in Michigan



With 9,402 miles of shoreline in Michigan, wind energy is truly a viable option for everyone. Cover photo courtesy: FEV Inc.

Regional Advantages for Alternative Energy Companies

- ◆ The Great Lakes are the largest and potentially greatest source of wind energy on the eastern two-thirds of the United States
- ◆ Michigan ranks among the top 20 states in wind energy capacity, with the potential to produce 17,000 megawatts, enough to power 4.1 million to 5.1 million homes a year
- ◆ Michigan's offshore wind power potential is estimated at 40,000 Mw
- ◆ Up to 20,000 acres of corn are grown every year for biotech purposes
- ◆ During summer months, Michigan receives the same amount of direct sunlight as Florida
- ◆ Michigan is surrounded by the Great Lakes, which contains the largest supply of fresh water in the world – 20 percent of the world's total fresh water
- ◆ Michigan's Renewable Portfolio Standard requires utility companies to generate at least 10 percent of their energy from renewable sources by 2015
- ◆ The Federal Government allotted \$2.4 billion for advanced battery and electric vehicle projects across the country. More than half will go to Michigan companies
- ◆ State officials' project that battery projects will create almost 7,000 jobs in the next 18 months and 40,000 by 2020
- ◆ More than 30,000 workers engaged in engineering, research and development
- ◆ Access to 2.7 million skilled manufacturing and technical workers
- ◆ Ranked second in the nation in R&D spending
- ◆ A region with over one-third of the state's R&D facilities
- ◆ Files over 3,000 patents annually, placing Michigan in the top-10 states for total number of patents granted



Solar Energy: Ranking midway on the PV Solar Radiation Scale, Michigan is a practical location for solar technologies and is a viable option for everyone.

Work Force: Educated, Innovative & Motivated

- ◆ Over 41 percent of Oakland County residents have college degrees (national average is about 26 percent)
- ◆ Oakland County has the third highest number of high-tech workers in the nation and twice the corporate R&D professionals compared to the national average
- ◆ Population of Michigan's work force: 5.1 million
- ◆ 15 public universities, 50+ independent universities and colleges, 29 community colleges in Michigan
- ◆ Over 96,000 college degrees are granted every year in Michigan – almost twice as many as the national average
- ◆ 2 ½ times the number of master's degrees were granted in Michigan than the national average
- ◆ Close to 1,500 Ph.D.'s are granted in Michigan every year – almost twice the national average
- ◆ Michigan colleges and universities graduate more than 10,000 engineers and technicians annually
- ◆ Michigan has a 79 percent retention rate for new engineering graduates
- ◆ On average, almost 2,000 students are enrolled in Alternative Energy courses and programs at state colleges and universities

NextEnergy

Launched in 2002, NextEnergy is one of the nation's leading research catalysts and business accelerators for alternative and renewable energy. Next Energy has experience working with utilities, alternative fuels, hybrid power trains, business development, venture capital investment and more in the alternative energy industry.

NextEnergy provides technology assessments, management and financial consulting services, access to demonstration and lab facilities, workshops, and matchmaking to alternative energy assets, suppliers and customers. Located in Detroit, Next Energy is within an hour drive of more than a dozen major research universities, and in the heartland of America's transportation, technology and manufacturing industries.



Michigan Universities: Research Centers - (Partial List)

Central Michigan University

- ◆ The Center for Applied Research and Technology

Eastern Michigan University

- ◆ Experimental Laser Physics Laboratory/Chemical Sensors

Grand Valley State

- ◆ Michigan Alternative & Renewable Energy Program

Kettering University

- ◆ Center for Fuel Cell Systems & Powertrain Integration

Lansing Community College

- ◆ Alternative Energy Engineering Program

Lawrence Technological University

- ◆ Alternative Energy Technology Center

Macomb Community College

- ◆ Center for Alternative Fuels

Michigan State University

- ◆ Energy Devices & Systems Center
- ◆ Great Lakes Bioenergy Research Center
- ◆ Land Policy Institute
- ◆ Office of Biobased Technology
- ◆ Michigan Biotechnology Institute
- ◆ Thermal Engineering Laboratory
- ◆ Turbomachinery Laboratory

Michigan Technological University

- ◆ Alternative Fuels Group Enterprise
- ◆ Center for Water and Society
- ◆ D80 Center
- ◆ Power and Energy Research Center (PERC)
- ◆ Sustainable Futures Institute (SFI)
- ◆ Wood-To-Wheel Program

Oakland Community College

- ◆ Customized Alternative Energy Programs & Certificates

Oakland University

- ◆ Clean Energy Research Center
- ◆ Product Development and Manufacturing Center

University of Michigan

- ◆ Alternative Fuels & Vehicles
- ◆ Center for Sustainable Systems
- ◆ Center for Transportation
- ◆ Environmental Management Institute

- ◆ Erb Institute for Global Sustainable Enterprise
- ◆ Michigan Memorial Phoenix Energy Institute
- ◆ DTE Power Electronics and Electric Drive Laboratory

Wayne State University

- ◆ Alternative Energy Center
- ◆ Smart Sensors and Integrated Microsystems

Green - These colleges or universities are either located in Oakland County or have campuses in Oakland County

Access to Capital and Worker Training

Oakland County's Business Development Team will help your company find potential sources of capital, financing and work force. They include:

- ◆ **Angel Networks** – Michigan has three active Angel Networks: The Great Lakes Angels, The Grand Angels and The Ann Arbor Angels
- ◆ **Oakland County Workforce Development** – Provides resources to find trained employees and opportunities for job seekers to identify and receive training to gain new skills
- ◆ **Renewable Energy Renaissance Zones** – State Education Tax, personal and real property taxes, and local income tax are reduced or eliminated by locating in a Renewable Energy Renaissance Zone
- ◆ **State Incentives** – The business development team provides expert assistance to eligible businesses seeking to obtain property tax abatements from local communities. The staff also offers consultation to those businesses that qualify for incentive programs available from the state of Michigan.
- ◆ **Venture Capital** – Over the last five years, more than \$729 million in venture capital has been invested in over 150 businesses in Michigan. For new high-technology industries, the state created the \$215 million Venture Michigan Fund I & II to promote investment in early-stage firms operating here. With the matching requirement, this initiative will attract an additional \$645 million in capital to Michigan for investment in promising new high-technology companies.



Leading Alternative Energy and Power Generation Companies in Oakland County

LUMA Resources, LLC

Robert and Gary Allen have transformed their family roofing and construction business into one of the most unique solar companies in the nation. In 2007, the brothers launched LUMA Resources LLC, to market their patented, UL-approved building integrated photovoltaic LUMA solar roof system. It's a metal roofing shingle and a solar energy collector all in one.

The catalyst for LUMA's transformation was made possible by a \$500,000 federal Recovery Act grant and a \$200,000 loan from Michigan's Department of Energy, Labor & Economic Growth. "We appreciated the constant support we received from the state and our local governments. We have great people to work with in our area, from engineers to government officials," said Robert Allen, president of Luma Resources LLC.

Robert and Gary's entrepreneurial spirit was



recognized by President Obama, in his State of the Union address in 2011. "We're issuing a challenge. We're telling America's scientists and engineers that if they assemble teams of the best minds in their fields, and focus on the hardest problems in clean energy, we'll fund the Apollo projects of our time. That dream – that American Dream – is what drove the Allen Brothers to reinvent their roofing company for a new era," said President Obama.



DOKKA Fasteners, Inc.

Dokka Fasteners CEO Marc Strandquist reports, "When Dokka decided to expand its manufacturing operations into the U.S., we looked at a few states including Illinois, Missouri, Indiana and Michigan.

"Because of the overwhelming support from the state, Oakland County, and the city of Auburn Hills, we decided to locate our new \$20 million state-of-the-art robotic hot forming manufacturing plant right here in Oakland County.

"Michigan is developing into an epicenter for wind energy technology and manufacturing, and coupled with the exponential growth of the wind farms throughout the state, the Auburn Hills location was ideal for Dokka Fasteners to support the North American wind market.

"Our fully automated manufacturing process in Auburn Hills is the first of its kind in the U.S., and replicates the high tech process found in Dokka's facility in Norway."



Photo courtesy: Arvid Nilsson

Alternative Energy and Power Generation Technology - (Partial List)

Oakland County Companies

Aarell Company – Troy
ABB Power Generation – Auburn Hills
Adco Circuits Inc. – Rochester Hills
Admamede LLC – Southfield
ALTe, LLC – Auburn Hills
American Instrumentation, Inc. – Highland
Amerigon – Northville
Applied Building Science Inc. – Royal Oak
Auxiliary Energy Solutions – Farmington Hills
Balance4Earth LLC – Farmington Hills
Biomim Inc. – Oak Park
Bosch Rexroth Intelligent Hydraulic Drive – Rochester Hills
Bratic Enterprises LLC – Royal Oak
Bright Automotive – Rochester Hills
Clayton Industries – Farmington Hills
COBASYS/SB LiMotive North America – Orion
Compact Power Inc. – Troy
Controlled Power Company – Troy
Coritech Services Inc. – Royal Oak
Criptonic Energy Solutions Inc. – Waterford
Crorey Renewable Sources – Beverly Hills
Cummins Bridgeway LLC – New Hudson
Dokka Fasteners – Auburn Hills
Encompass Energy Group – Southfield
Energy Conversion Devices Inc. – Rochester Hills
Enova Systems – Troy
FEV Technology – Auburn Hills
Franklin Wind Energy Group – Franklin
Gage Products Company – Ferndale
Galco Industrial Electronics – Madison Heights
Geo-Renew Systems Inc. – Holly
Global ET – Farmington Hills
GreenGo Tek LLC – Milford
Guardian Industries – Auburn Hills
Hybrid Design Services – Troy
Hydrogen Propulsion Systems of America – West Bloomfield
Icom North America LLC – New Hudson
Illumisys (Altair Engineering) – Troy
IMPCO Technologies – Sterling Heights
Inergy Automotive Systems – Troy
Inmatech – Northville
Lipten Co. LLC – Wixom
Luma Resources – Rochester Hills

Magna E-Car Systems of America – Auburn Hills
Midwest Thermal – Farmington Hills
Ming Scientific LLC – Auburn Hills
Nissan Technical Center NA – Farmington Hills
Novi Energy LLC – Novi
NxtGen Emission Controls Inc. – Wixom
Octillion – Auburn Hills
Ovonic Battery – Rochester Hills
Pilot Systems International LLC – Farmington Hills
PM Technologies – Wixom
Relume Technologies Inc. – Oxford
Resource Management Partners LLC – Farmington Hills
Siemens Energy – Troy
Thermal-Netics – Rochester Hills
ThermoAnalytics Inc. – Auburn Hills
Three M Tool & Machine Inc. – Novi
TransGreen Energy – New Hudson
Transonic Combustion Inc. – Bloomfield Hills
Umicore Autocat USA Inc. – Auburn Hills
United Solar Ovonic LLC – Auburn Hills
Venturi Automobiles – Auburn Hills
Williams International – Walled Lake
WindStream Technologies Inc. – Farmington Hills

Southeast Michigan Companies

3M Fuel Cell Components – Livonia
A3C Collaborative Architecture – Ann Arbor
ACCIO ENERGY – Ann Arbor
Adaptive Materials – Ann Arbor
Air Compressor Energy Systems, Inc. – Romulus
ALCO/NVC Inc. – Detroit
Alternative Fuel Technology LLC – Grosse Pte Park
Ardesta Ventures – Ann Arbor
Atlas Home Improvement Inc. – Whitmore Lake
August Test Company – Detroit
AVL North America – Plymouth
Beholz Technologies – Flint
BuildScan Thermography LLC – Ann Arbor
CD-Adapco – Plymouth
CHEMAC International Corp. – Macomb
City Creations Inc. – Detroit
Convergence LLC – Brighton
Dovetail Solar and Wind – Brighton
DTE Energy Technologies – Detroit

EcoMotors International – Allen Park
EcoVElectric – St. Clair
Emmeskay, Inc. – Plymouth
Encel – Ann Arbor
Enerex LLC – Harrison Twp.
Global Enerty Innovations – Flint
Hardin Geotechnologies Inc. – Warren
Honeland Builders Group – Ann Arbor
Hot Watt Solar LLC – Harrison Twp.
Mayamaterials – Ann Arbor
Mechanical Energy Systems Inc. – Canton
Next Energy Center – Detroit
Nextek Power Systems Inc. – Detroit
Pacific Industrial Development Corp. – Ann Arbor
PowerInQ, LLC – Detroit
Praxair – Ecorse
Primafuel Inc – Warren
Renovare Energy Inc. – Ann Arbor
RMT Inc. – Romulus
RS Electronics – Ann Arbor
S.U.R. Energy Systems LLC – Ann Arbor
SB LiMotive Germany GmbH – Ann Arbor
Smart Vision Lights – Plymouth
STM Power Inc. – Ann Arbor
S-Y Systems Technology – Ann Arbor
T3 Motion Inc. – Ann Arbor
Walker-Miller Energy Services LLC – Detroit

Michigan Companies

A & B Machining – Fruitport
A.B. Myr Industries Inc. – Belleville
A.C. Mechanical Experts Inc. – Armada
A-1 Mechanical – Lansing
Advanced Battery Technologies – Brownstown
AIM Industries – Grand Haven
Aircraft Precision Products – Ithaca
AlgerDelta Electric – Gladstone
All Weather Seal Co. Inc. – Bay City
Applegate Insulation Manufacturing Inc. – Webberville
Armstrong International Inc. – Three Rivers
Backwards to the Future Ltd. – Fennville
Bauer Power Inc. – Wayland
BTF Solar – Fennville
Burr Oak Tool Inc. – Sturgis

CMS Energy Corp. – Jackson
Coffman Electrical Equipment – Grand Rapids
Crystal Flash Energy – Grand Rapids
Currin Corporation – Midland
Diversified Natural Products Inc. – Scottville
Dow Chemical Co. – Midland
EBW Electronics Inc. – Holland
Fuel Cell Safety Systems – Grandville
Grayling Generating Station – Grayling
Heat Transfer International – Kentwood
Helix Synergy LLC – Montague
Hybra Drive Systems LLC – Deerfield
Johnson Controls - Saft – Holland
K & M Machine Fabricating Inc. – Cassopolis
KD Advanced Battery Group LLC – Midland
Kinetic Wave Power LLC – Midland
Kraftube Inc. – Reed City
Light Corporation – Grand Haven
Mackinaw Power LLC – Lowell
Michigan BioDiesel LLC – Bangor
Northwoods Energy Alternatives – Lake Leelenau
Panoramic Electric – Traverse City
Patriot Solar Group – Albion
Pernetic Generator Group LLC – Wyandotte
Persu Mobility – Wyandotte
Phoenix Navigation (PNG, Inc.) – Munising
POET Biorefining – Caro
PrimeStar Solar – Montague
REB Research & Consulting – Montague
Renewable Energy Solutions – Grand Rapids
RKA Petroleum Companies – Van Buren Twp.
SES Flexcharge USA – Charlevoix
ShadePlex LLC – Charlevoix
Southwest Research Institute – Muskegon
Spectrum Illumination LLC – Muskegon
SPM Windpower – Hastings
Stirling Biopower Inc. – Hastings
T/J Technologies Inc. – Dearborn
Tellurex Corp. – Traverse City
Texaco Ovonic Hydrogen Systems – Traverse City
Titan Equipment – Lansing
US BioEnergy – Lake Odessa
US Energia LLC – Woodbury
Wind Power Services LLC – Leroy
Zeeland Farm Services Inc. – Zeeland

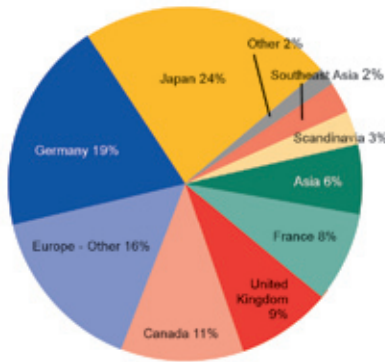
Oakland County Can Help Your Business

- ◆ Site location
- ◆ Financing
- ◆ Tax Incentives
- ◆ Liaison with state and local agencies
- ◆ Workforce development
- ◆ Business Assistance Center (business consulting)
- ◆ Demographic products – to ensure you make the right decision for your company’s location

Oakland County is an International Hub

Foreign firms make the strategic decision to locate in Oakland County because of our highly skilled work force, strong educational systems and the international support available to them.

- ◆ More than 700 foreign-owned firms from 37 countries – with more than 850 business location – are located in Oakland County
- ◆ 19 school districts and three consortium schools in Oakland County offer Mandarin Chinese language programs
- ◆ Oakland County has more than 93,000 people in the labor force comprised of professional, scientific and technical services skills
- ◆ Oakland County International Airport is one of the busiest corporate airports in the United States, with more than half a million passengers annually



L. Brooks Patterson,
Oakland County Executive

*With the support of
The Oakland County Board
of Commissioners*

Oakland County is a Strategic Location



Centrally located between Chicago, Toronto and Cleveland

- ◆ Oakland County is strategically positioned to capture the entire Midwest market
- ◆ The Michigan-Ontario border is the busiest international crossing in the country, making this area an ideal location to reach the United States and Canadian market
- ◆ Ontario, less than an hour drive from Oakland County, generates 40 percent of Canada’s total domestic product



Contact us today for more information:

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