Pure Michigan Export Program

“Exporting Sustainable Energy Products to the World”

Sustainable Energy for Sustainable Development Conference

Michigan State University

October 23, 2012
Deanna Richeson
Director, Export Program
Michigan Economic Development Corporation
MEDC Strategy to Develop/Support Renewable Energy Products

- Potential for significant growth
- Leverage state strengths
- Generally not mature

1. Advanced Energy Storage
2. Wind Turbine Mfg.
3. Solar/Photovoltaic
4. Bioenergy
Advanced Energy Storage (Batteries)
Michigan Assets: Strong Supply Chain

Announced Investment Since 11/2008

Materials/Components

Cell Manufacturing

LG Chem

MagnePower

Techno Semichem Co., Ltd.

Toda America

SAFT

AsahiKASEI

Dow Kokam

Extreme Power

SB LiMotive

fortu Holding AG

SAKTi3

Component Suppliers

Pack Manufacturing

Magna

Transmatic

Pep Stations

Peugeot

Ford

Dow Kokam

Component Integration

Engineering/R&D/Testing

FEV

Hitachi

Chrysler

AZD

Eaton

Vehicle Assembly

Ford

GM

ABB

And Technology Inc.

AVL

Comau

KUKA

Automation/Mfg/Test Equipment

Recycling

Announced Investment Since 11/2008

>$5.7B
Michigan Assets: Vehicle Builds

**Available Now**
- Azure Dynamics Balance Hybrid Electric Trucks
  - Oak Park, MI
- Ford Transit Connect Electric
  - Livonia, MI

**Now on our Roads!**
- Chevy Volt
  - Hamtramck, MI
- Ford Focus Electric
  - Wayne, MI
- Ford C-Max Energi (PHEV)
  - Wayne, MI

Available Now
- Ford C-Max Energi (PHEV)
  - Wayne, MI
- 2012 Model
- 2013 Model
Wind Power Generation
Why Wind Turbine Manufacturing in MI

- Michigan Strengths – Advanced manufacturing capabilities, product development & engineering resources, materials & composites expertise

- Onshore and Offshore Capacity – 16,650 MW potential in onshore alone

- 10% Renewable Portfolio Standard by 2015 – requires nearly 1100 turbines.

- Logistically located to supply Midwest and Ontario
Capabilities Analysis

SOURCE: Center on Globalization, Governance & Competitiveness
Corporate or Regional Capability Analysis

Value Chain

<table>
<thead>
<tr>
<th>Materials</th>
<th>Component Design</th>
<th>Manufacturing</th>
<th>Logistics &amp; Ops</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;D Process Innovation</td>
<td>R&amp;D Design Validation</td>
<td>R&amp;D Production</td>
<td>Transport O&amp;M</td>
</tr>
</tbody>
</table>

- **Rotor**
  - High

- **Gearbox**
  - Low

- **Generator**
  - Low

- **Controls & Electronics**
  - Low

- **Tower and Foundation**
  - Low

**Illustrative**
Wind & Solar Supply Chain in Michigan

• 121 solar power supply chain businesses

• 120 wind power supply chain businesses

• Old line manufacturing companies are re-tooling to make renewable energy equipment for growing markets
Michigan: A Leading Supplier to the Solar Industry

- 121 solar power supply chain businesses
- Michigan is home to sealant manufacturers and robotics suppliers, as well as the world’s largest manufacturer of polycrystalline silicon.
Bioenergy Facilities in Michigan
Michigan Exports of Electrical Storage Batteries
North American Leader

<table>
<thead>
<tr>
<th>Exports To</th>
<th>2009 Value</th>
<th>$ Change</th>
<th>Growth%</th>
<th>2010 Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>$ 1,210,835</td>
<td>$ 3,308,348</td>
<td>273.23%</td>
<td>$ 4,519,183</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>$ 6,070,367</td>
<td>-$ 814,836</td>
<td>-16.07%</td>
<td>$ 4,255,531</td>
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<tr>
<td>Germany</td>
<td>$ 1,152,054</td>
<td>$ 2,588,799</td>
<td>224.71%</td>
<td>$ 3,740,853</td>
</tr>
<tr>
<td>China</td>
<td>$ 1,305,756</td>
<td>$ 989,043</td>
<td>75.74%</td>
<td>$ 2,294,799</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>$ 1,224,145</td>
<td>$ 956,769</td>
<td>78.16%</td>
<td>$ 2,180,914</td>
</tr>
<tr>
<td>Japan</td>
<td>$ 306,810</td>
<td>$ 869,009</td>
<td>293.24%</td>
<td>$ 1,175,819</td>
</tr>
<tr>
<td>France</td>
<td>$ 244,087</td>
<td>$ 582,900</td>
<td>238.81%</td>
<td>$ 826,987</td>
</tr>
<tr>
<td>Russia</td>
<td>$ 24,339</td>
<td>$ 801,972</td>
<td>3,295.01%</td>
<td>$ 826,311</td>
</tr>
<tr>
<td>Mexico</td>
<td>$ 276,690</td>
<td>$ 254,959</td>
<td>92.15%</td>
<td>$ 531,049</td>
</tr>
<tr>
<td>Finland</td>
<td>$ 11,774</td>
<td>$ 501,226</td>
<td>4,257.06%</td>
<td>$ 513,000</td>
</tr>
</tbody>
</table>
Trend Analysis for Top Growing U.S. Export Markets (Electric Storage Batteries)

<table>
<thead>
<tr>
<th>Exports To</th>
<th>2010 Value</th>
<th>$ Change</th>
<th>Growth%</th>
<th>2011 Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>$637,254,212</td>
<td>$127,382,128</td>
<td>19.99%</td>
<td>$764,636,340</td>
</tr>
<tr>
<td>Mexico</td>
<td>$244,617,498</td>
<td>$47,281,198</td>
<td>19.30%</td>
<td>$292,198,696</td>
</tr>
<tr>
<td>Finland</td>
<td>$15,818,120</td>
<td>$33,619,717</td>
<td>212.54%</td>
<td>$49,437,837</td>
</tr>
<tr>
<td>Belgium</td>
<td>$48,142,823</td>
<td>$28,823,173</td>
<td>59.87%</td>
<td>$76,965,996</td>
</tr>
<tr>
<td>Russia</td>
<td>$3,639,213</td>
<td>$19,611,987</td>
<td>497.87%</td>
<td>$23,551,200</td>
</tr>
<tr>
<td>Australia</td>
<td>$31,371,537</td>
<td>$18,650,043</td>
<td>59.45%</td>
<td>$50,021,580</td>
</tr>
<tr>
<td>Korea</td>
<td>$42,092,475</td>
<td>$18,593,995</td>
<td>44.17%</td>
<td>$60,686,470</td>
</tr>
<tr>
<td>Chile</td>
<td>$13,633,823</td>
<td>$17,687,919</td>
<td>129.74%</td>
<td>$31,321,742</td>
</tr>
<tr>
<td>Germany</td>
<td>$28,256,084</td>
<td>$11,420,147</td>
<td>40.42%</td>
<td>$39,676,231</td>
</tr>
<tr>
<td>Brazil</td>
<td>$44,446,035</td>
<td>$8,572,675</td>
<td>19.29%</td>
<td>$53,018,710</td>
</tr>
</tbody>
</table>

Data source: U.S. Census
Trend Analysis for Top Growing U.S. Export Markets (Wind Turbines)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Top Markets</th>
<th>2010 Value</th>
<th>Growth %</th>
<th>$ Change</th>
<th>2011 Value</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Canada</td>
<td>$26,753,826</td>
<td>-22.6%</td>
<td>-$6,090,066</td>
<td>$20,662,860</td>
<td>43.5%</td>
</tr>
<tr>
<td>2</td>
<td>Turkey</td>
<td>$27,358</td>
<td>11,953.7%</td>
<td>$3,270,281</td>
<td>$34,628,569</td>
<td>6.9%</td>
</tr>
<tr>
<td>3</td>
<td>Poland</td>
<td>$1,506,443</td>
<td>94.0%</td>
<td>1,340,718</td>
<td>$2,937,161</td>
<td>6.2%</td>
</tr>
<tr>
<td>4</td>
<td>Venezuela</td>
<td>$450,372</td>
<td>302.0%</td>
<td>$1,360,026</td>
<td>$1,810,398</td>
<td>3.8%</td>
</tr>
<tr>
<td>5</td>
<td>Brazil</td>
<td>$935,615</td>
<td>70.9%</td>
<td>863,183</td>
<td>$1,598,798</td>
<td>3.4%</td>
</tr>
<tr>
<td>6</td>
<td>Paraguay</td>
<td>$17,741</td>
<td>8,809.4%</td>
<td>1,527,399</td>
<td>$1,545,140</td>
<td>3.3%</td>
</tr>
<tr>
<td>7</td>
<td>Dominican Republic</td>
<td>$973,399</td>
<td>37.8%</td>
<td>367,547</td>
<td>$1,340,946</td>
<td>2.8%</td>
</tr>
<tr>
<td>8</td>
<td>Korea</td>
<td>$1,952,306</td>
<td>-36.6%</td>
<td>-715,186</td>
<td>$1,237,120</td>
<td>2.6%</td>
</tr>
<tr>
<td>9</td>
<td>French Guiana</td>
<td>$1,305,918</td>
<td>-11.5%</td>
<td>-149,884</td>
<td>$1,156,034</td>
<td>2.4%</td>
</tr>
<tr>
<td>10</td>
<td>Guadeloupe</td>
<td>$375,526</td>
<td>176.6%</td>
<td>862,994</td>
<td>$1,038,520</td>
<td>2.2%</td>
</tr>
</tbody>
</table>

Market Value: $47,473,184
Trend Analysis for Top Growing U.S. Export Markets (Solar Panels*)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Top Markets</th>
<th>2009 Value</th>
<th>Growth %</th>
<th>$ Change</th>
<th>2010 Value</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Germany</td>
<td>$656,247,861</td>
<td>13.2%</td>
<td>$88,722,287</td>
<td>$742,970,148</td>
<td>22.9%</td>
</tr>
<tr>
<td>2</td>
<td>Canada</td>
<td>$190,237,210</td>
<td>100.9%</td>
<td>$192,035,925</td>
<td>$382,273,135</td>
<td>11.8%</td>
</tr>
<tr>
<td>3</td>
<td>Hong Kong</td>
<td>$168,735,997</td>
<td>83.5%</td>
<td>$140,956,547</td>
<td>$309,692,544</td>
<td>9.5%</td>
</tr>
<tr>
<td>4</td>
<td>Mexico</td>
<td>$223,374,641</td>
<td>16.3%</td>
<td>$38,460,147</td>
<td>$259,834,788</td>
<td>8.0%</td>
</tr>
<tr>
<td>5</td>
<td>Japan</td>
<td>$126,916,849</td>
<td>73.2%</td>
<td>$92,878,534</td>
<td>$219,795,383</td>
<td>6.8%</td>
</tr>
<tr>
<td>6</td>
<td>Singapore</td>
<td>$100,950,656</td>
<td>103.9%</td>
<td>$104,878,290</td>
<td>$205,828,946</td>
<td>6.3%</td>
</tr>
<tr>
<td>7</td>
<td>China</td>
<td>$93,007,117</td>
<td>69.7%</td>
<td>$64,851,730</td>
<td>$157,858,847</td>
<td>4.9%</td>
</tr>
<tr>
<td>8</td>
<td>France</td>
<td>$122,987,953</td>
<td>26.5%</td>
<td>$32,545,267</td>
<td>$155,533,220</td>
<td>4.8%</td>
</tr>
<tr>
<td>9</td>
<td>Italy</td>
<td>$91,195,988</td>
<td>51.1%</td>
<td>$48,612,542</td>
<td>$137,808,530</td>
<td>4.2%</td>
</tr>
<tr>
<td>10</td>
<td>Korea</td>
<td>$95,116,752</td>
<td>-22.3%</td>
<td>$-21,219,636</td>
<td>$73,897,116</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

*Photosensitive Semiconductor Devices

PIERS
Pure Michigan Export Program

Program Objectives

• Increase export sales by Michigan companies

• Increase number of new-to-export SMEs

• Increase entry into new markets by companies

$197,000 IN EXPORT REVENUES = ONE MICHIGAN JOB

International Trade Administration (ITA)
FY 2012: 132 Companies Entered 62 New Markets
“We are reinventing Michigan in a way that works better for our businesses and creating strong tools like the Pure Michigan Export Program to help Michigan companies compete globally and diversify their customer base.”

Rick Snyder, Governor
Questions?

Deanna Richeson
Director, Export Director
Michigan Economic Development Corporation
richesond@michigan.org