

# Michigan Public Service Commission Renewable Energy Report Overview

## MREP Solar Committee Meeting

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**Any views expressed are my own and not necessarily  
that of the Michigan Public Service Commission**

- 2008 PA 295, cited as the Clean, Renewable and Efficient Act (Act), requires Michigan electric providers to provide customers with at least ten percent of their electricity from renewable energy sources by 2015.
- Electric providers are expected to meet these requirements through the purchase and/or production of Renewable Energy Credits (RECs).
- <http://www.legislature.mi.gov/documents/2007-2008/publicact/pdf/2008-PA-0295.pdf>

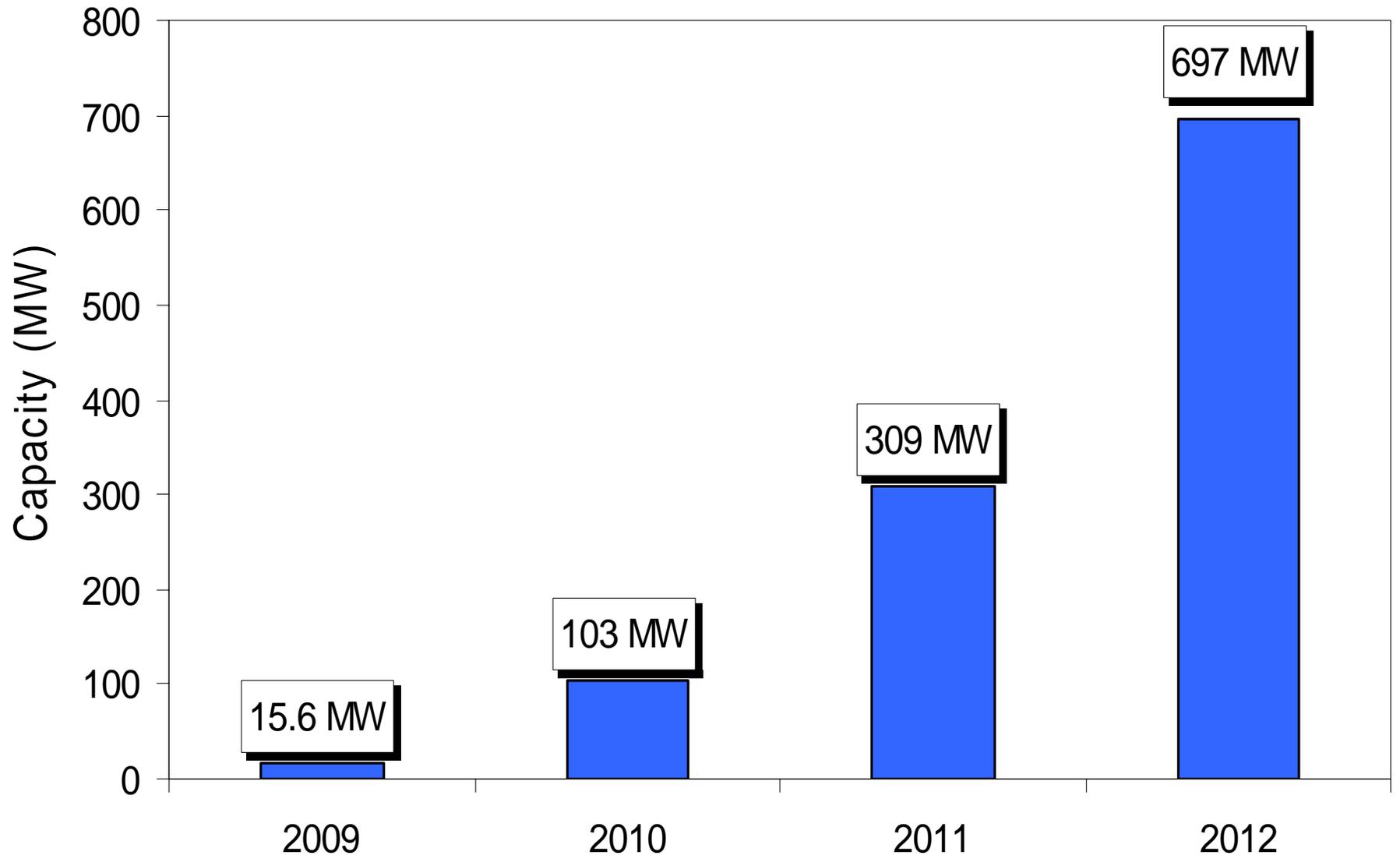
- Sec. 51(5): By February 15, 2011 and each year thereafter, the commission shall submit to the [legislators] ... a report that does all of the following:
  - (a) Summarizes data collected under this section.
  - (b) Discusses the status of renewable energy and advanced cleaner energy in this state and the effect of this subpart and subpart B on electricity prices.
  - (c) ... specifies the difference between the cost of the renewable energy and the cost of electricity generated from new conventional coal-fired electric generating facilities.
  - (d) Discusses how the commission is fulfilling the requirements of subsection (4) (annual reports).
  - And...

- (e) Evaluates whether this subpart has been cost-effective.
- (f) Provides a comparison of the cost effectiveness of the methods of an electric utility with 1,000,000 or more retail customers in this state as of January 1, 2008 obtaining renewable energy credits under the options described in section 33 (self build vs PPA).
- (g) Describes the impact of this subpart on employment in this state.
- (h) Describes the effect of the percentage limits under section 27(7) on the development of advanced cleaner energy (10% ACEC limit).
- (i) Makes any recommendations the commission may have concerning amendments to this subpart...

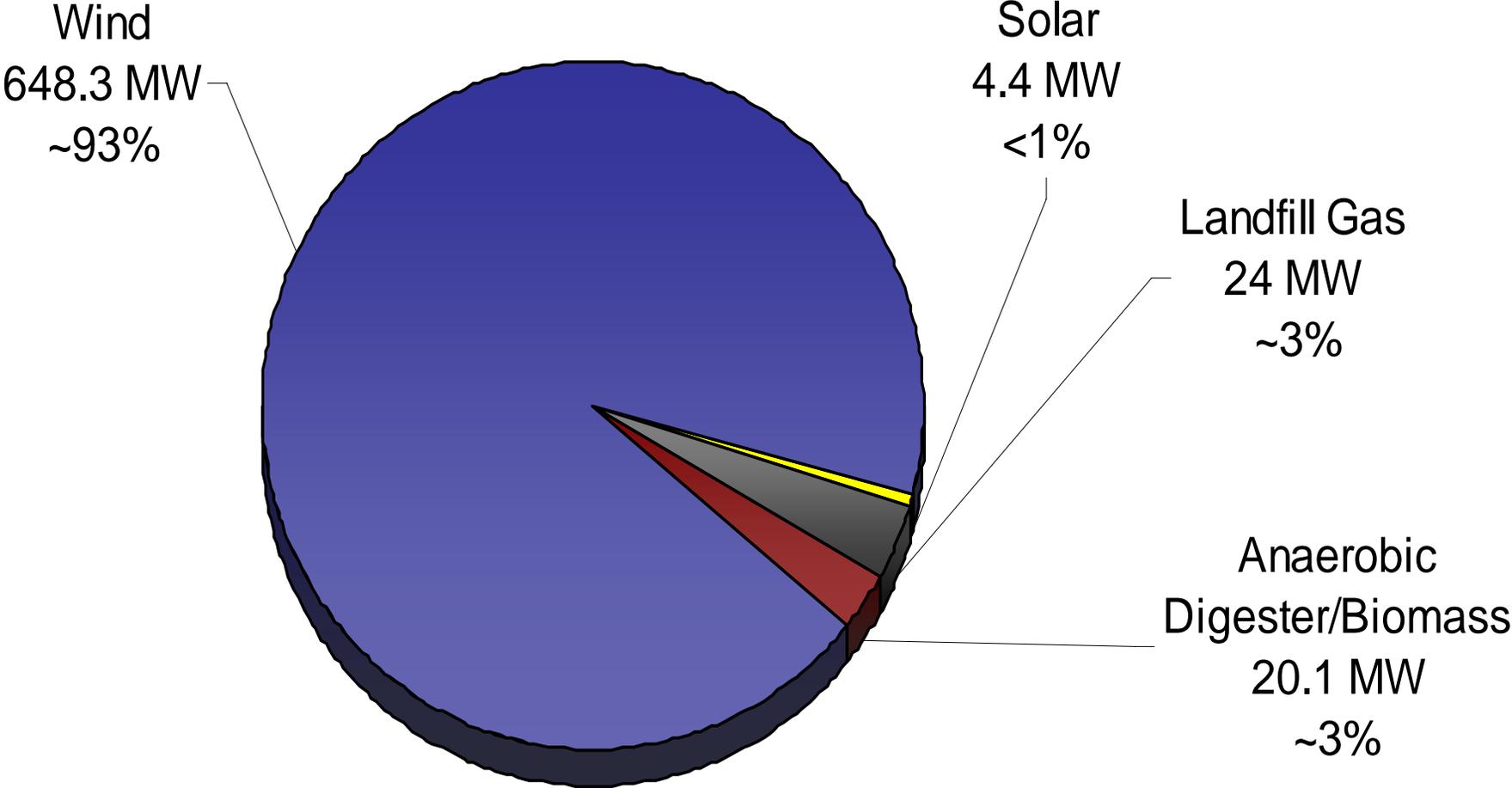
- 74 Renewable Energy Plans  
Approved in 90 days or less
  - 9 IOUs
  - 10 Cooperatives
  - 41 Munis
  - 14 AES

- Three expected not to make the 10% Requirement due to surcharge caps
  - City of Sebewaing
    - 0.04% of Michigan's load
  - Detroit Public Lighting
    - 0.5% of Michigan's load
  - WE Energies
    - 2.5% of Michigan's load

- 2007 renewable energy percentage was 2.9%
- Annual report data shows that Michigan's 2009 renewable energy percentage was 3.6%
- Approximately 700 MW of new renewables will be commercially operational by the end of 2012 (~6%)



# New Capacity (MW) by Technology



- Detroit Edison's SolarCurrents
  - Approximately 3 MW\*
- Consumers Energy's Experimental Advanced Renewable Program
  - Approximately 1 MW\*
- Will provide a combined total of 22 MW when completed

\*from contracts approved at the time of the report

## Consumers Energy : Request for Proposals/Requests for Information/Pre-Qualifications

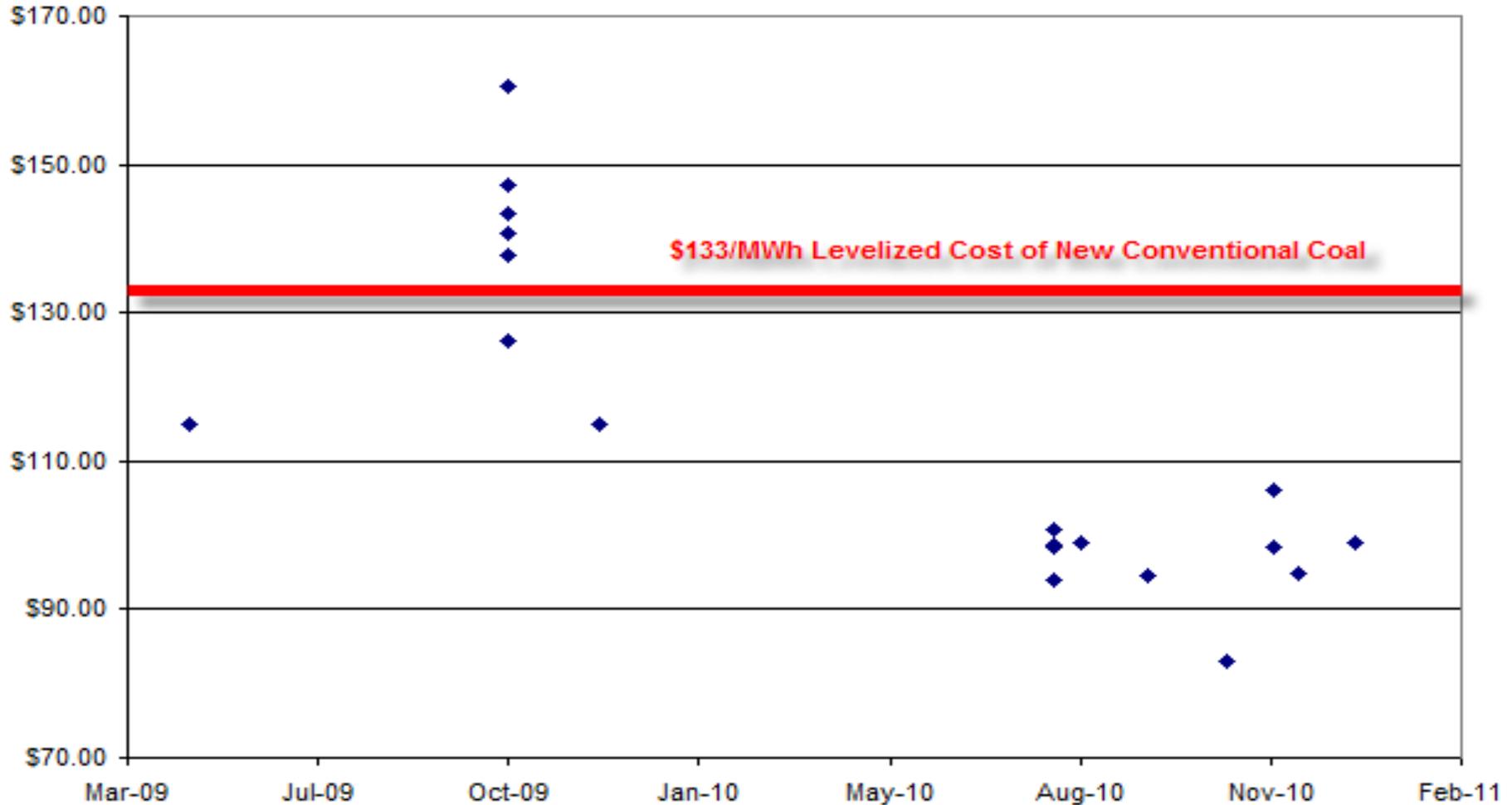
Issue Date	Type	Company Owned	Applicable Technology*	Responses
7/23/2010	RFP			7 Proposals
1/15/2010	RFP			11 Proposals/ 4 Suppliers
7/27/2009	RFP			Yes
2/19/2010	RFQ	Yes	Wind	8 Recipients
7/14/2010	RFQ	Yes	Wind	8 Recipients
5/7/2009	RFP	No	All	80 Proposals
1/29/2009	RFP	No	All	12 Proposals/ 11 Suppliers

**Detroit Edison Company : Request for Proposals/Requests for Information/Pre-  
Qualifications**

<b>Issue Date</b>	<b>Type</b>	<b>Company Owned</b>	<b>Applicable Technology*</b>	<b>Responses</b>
11/18/2010	RFP	No	All	In Progress
7/26/2010	Pre-Q	Yes	Wind	In Progress
3/29/2010	SOI	Yes	Solar	10 Responses
11/23/2009	RFP	Yes	Solar	11 Proposals
10/23/2009	Pre-Q	Yes	Solar	30 Responses
8/18/2009	RFP	Yes	Wind	12 Proposals/ 9 Suppliers
8/18/2009	RFP	No	All	35 Proposals/ 21 Suppliers
5/22/2009	RFI	Yes	Wind	155 Registered 27 Responses
12/23/2008	RFP	No	All	43 Proposals/ 11 Suppliers

# Renewable Energy vs New Coal

Six 10/09 contracts are representative of the fill-in price



## Average Levelized Renewable Energy Contract Prices for Consumers Energy and Detroit Edison

<b>Consumers Energy</b>					
<b>Technology</b>	<b>Wind</b>	<b>Anaerobic Digester</b>	<b>Biomass</b>	<b>Landfill Gas</b>	<b>Hydro</b>
<b>Average</b>	\$98.83	\$128.14	--	\$127.53	\$143.50
<b>Detroit Edison</b>					
<b>Technology</b>	<b>Wind</b>	<b>Anaerobic Digester</b>	<b>Biomass</b>	<b>Landfill Gas</b>	<b>Hydro</b>
<b>Average</b>	\$104.72		\$98.94	\$98.97	--
<b>Combined Average</b>	<b>\$101.78</b>	<b>\$128.14</b>	<b>\$98.94</b>	<b>\$113.25</b>	<b>\$143.50</b>

# Cost of 2008 PA 295

## Weighted Average Cost Based on Lifecycle MWh

Energy Optimization

**\$13.25**

Renewable Energy

**\$98.68**

Combined

**\$52.49**

## Consumers Energy Contracts

Quantity	Cost*	Term	Renewable Energy Type
100.8 MW	<b>\$95.00/MWh</b>	Company Owned	Wind
28.6 MW	<b>\$106.20 MWh</b>	20 Years	Wind
12.3 MW	<b>\$98.50 MWh</b>	20 Years	Wind
Commercial 836.6 KW Residential 200.1 KW	<b>Commercial \$0.45/KWh Residential \$0.65/KWh</b>	12 Years	Solar
0.35 MW	<b>\$83.07/MWh</b>	63 Months	Anaerobic
81 MW	<b>\$100.88/MWh</b>	20 Years	Wind
59.4 MW	<b>\$98.38/MWh</b>	20 Years	Wind
90 MW	<b>\$94.00/MWh</b>	20 Years	Wind
12.8 MW	<b>\$98.75/MWh</b>	20 Years	Landfill Gas
1.6 MW	<b>\$122.39/MWh</b>	20 Years	Landfill Gas
1.6 MW	<b>\$137.27/MWh</b>	20 Years	Landfill Gas
0.7 MW	<b>\$121.31/MWh</b>	10 Years	Hydro
1.6 MW	<b>\$122.20/MWh</b>	7 Years	Landfill Gas
3.1 MW	<b>\$139.35/MWh</b>	20 Years	Anaerobic
0.82 MW	<b>\$138.17/MWh</b>	7 Years	Anaerobic

**Total: 396 MW**

## Detroit Edison Contracts

Quantity	Cost*	Term	Renewable Energy Type
3.2 MW	<b>\$99.00/MWh</b>	20 Years	Landfill
200 MW Total 89.6 MW Company Owned	<b>\$94.43/MWh</b>	20 Years / Company Owned	Wind
3.2 MW	<b>Combined average price of \$98.94/MWh</b>	20 years	Landfill
17 MW		20 years	Biomass
Firm 210,000 RECs w/additional  112,000 RECs dependent on generation	<b>\$7.75/ REC</b>	7 Years	Hydro
Up to 3 MW	<b>Up to \$18 Million</b>	Company Owned	Solar
12.2 MW	<b>\$115.00/MWh</b>	20 Years	Wind
Firm 500,000 RECs	<b>Combined average price of \$12.46/REC</b>	7 Years	Hydro
Firm 2,500,000 RECs		10 Years	MISC
14 MW	<b>\$115.00/MWh</b>	20 Years	Wind

**Total: 252 MW**

# Recommendations for 2008 PA 295

Stay the course

# Recommendations for the Solar Industry

- Learning Curve Cost Reductions
  - Modules
  - BOS
  - Installation
- Increased Capacity Factors

# Learning Curve Cost Reductions



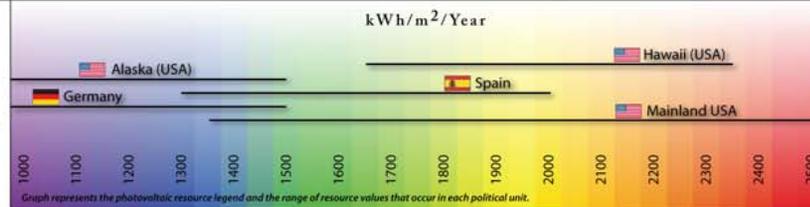
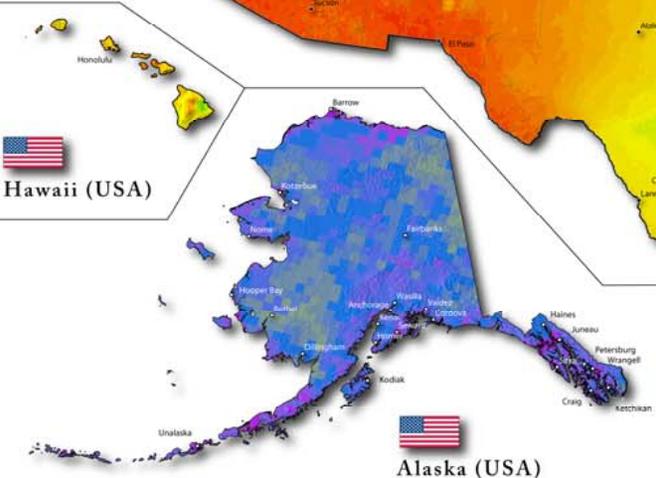
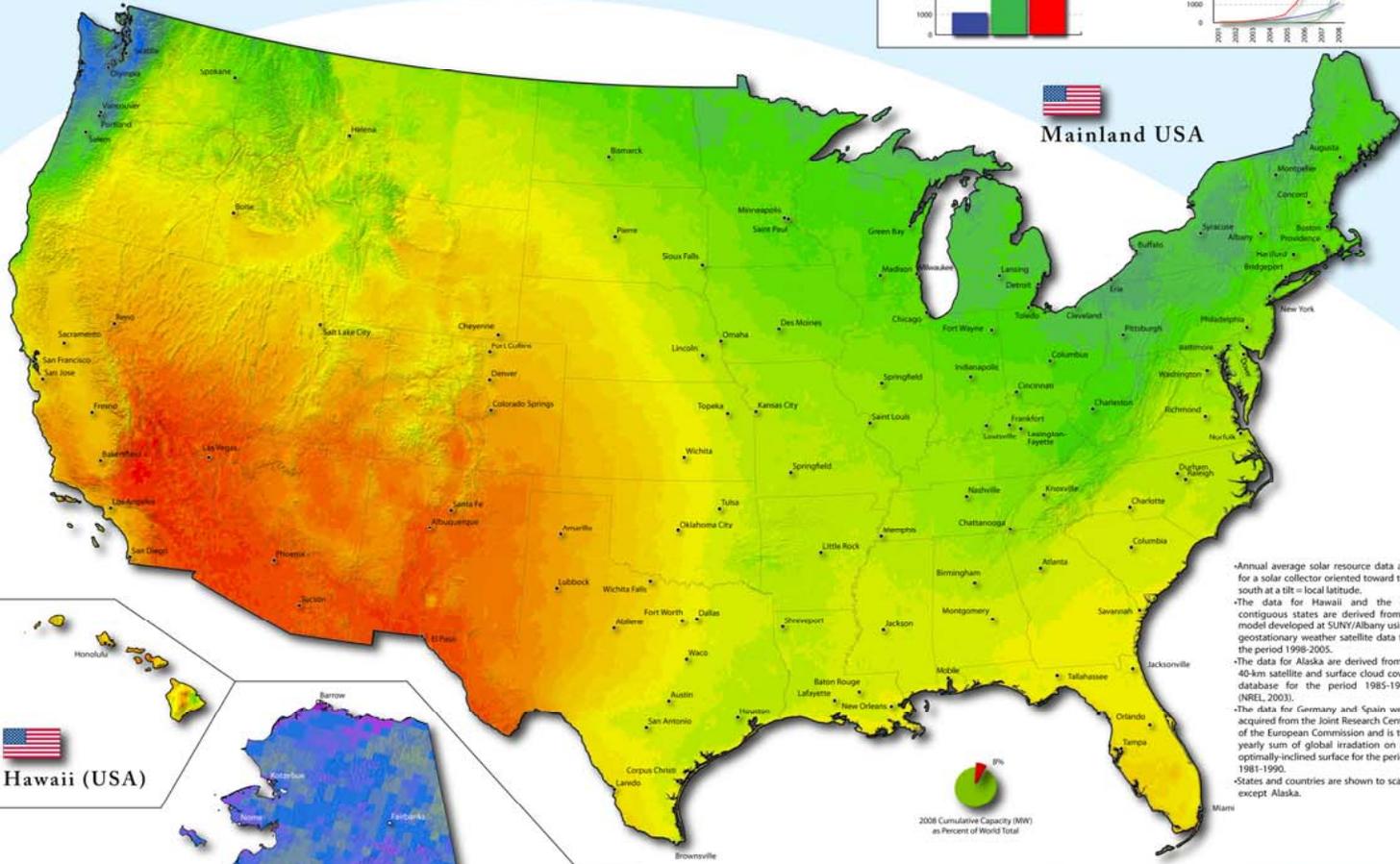
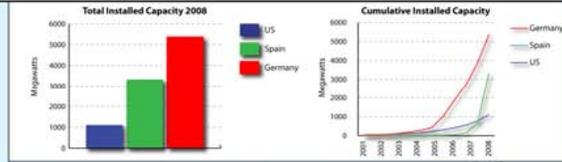
## SunShot

- *The DOE SunShot Initiative is a collaborative national initiative to make solar energy technologies cost-competitive with other forms of energy by reducing the cost of solar energy systems by about 75% before 2020.*

<http://www1.eere.energy.gov/solar/sunshot/>

# Increased Capacity Factors

## Photovoltaic Solar Resource The United States of America, Spain and Germany

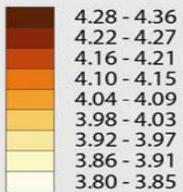


-Annual average solar resource data are for a solar collector oriented toward the south at a tilt = local latitude.  
 -The data for Hawaii and the 48 contiguous states are derived from a model developed at SUNY/Albany using geostationary weather satellite data for the period 1998-2005.  
 -The data for Alaska are derived from a 40-km satellite and surface cloud cover database for the period 1985-1991 (NREL, 2003).  
 -The data for Germany and Spain were acquired from the Joint Research Centre of the European Commission and is the yearly sum of global irradiation on an optimally-inclined surface for the period 1981-1990.  
 -States and countries are shown to scale, except Alaska.

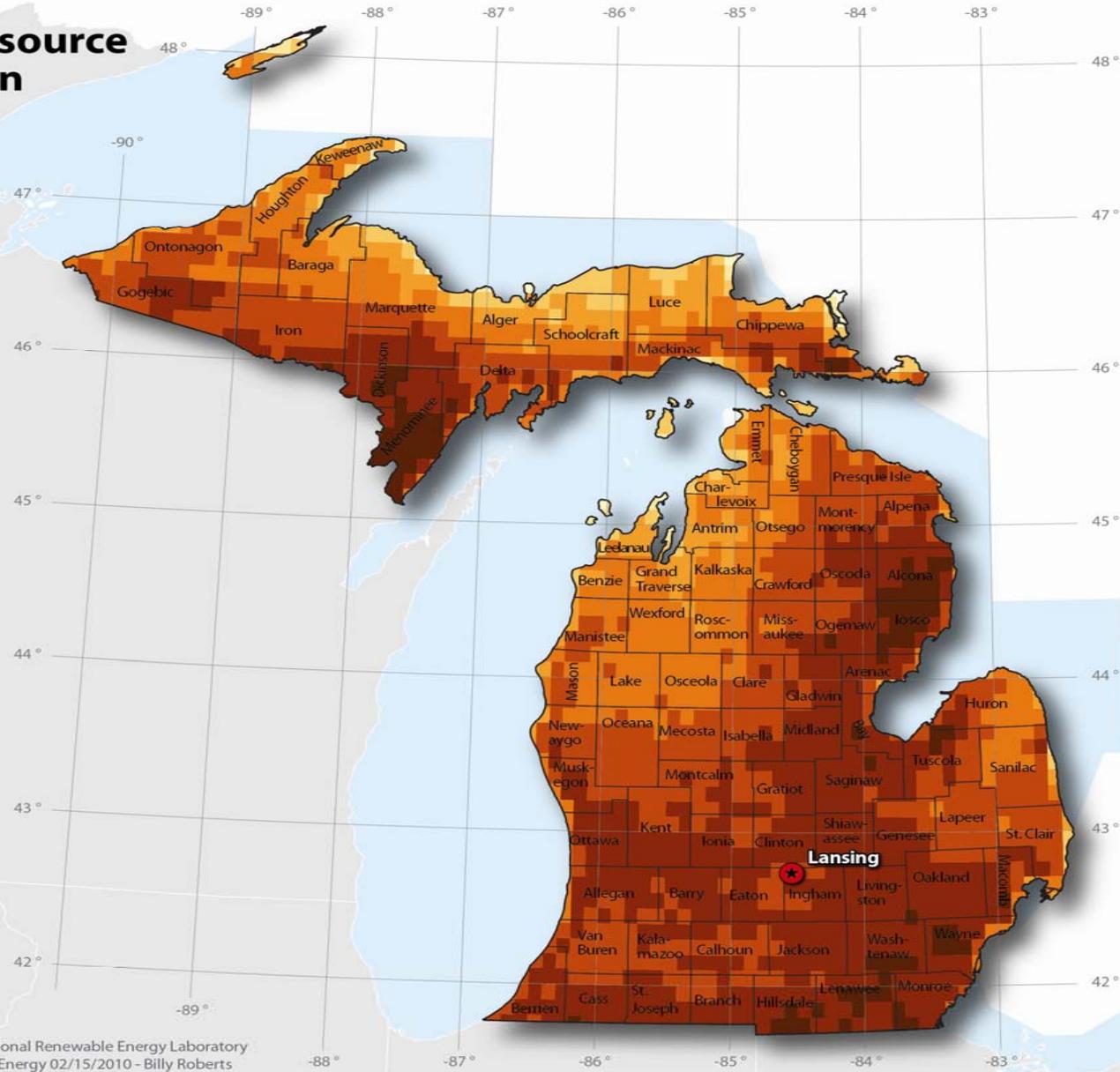
# Increased Capacity Factors

## Photovoltaic Solar Resource State of Michigan

kWh/m<sup>2</sup>/Day

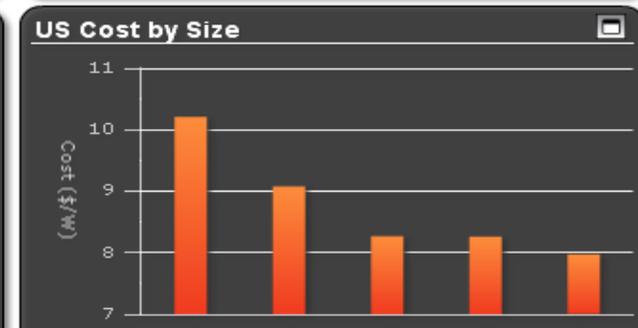
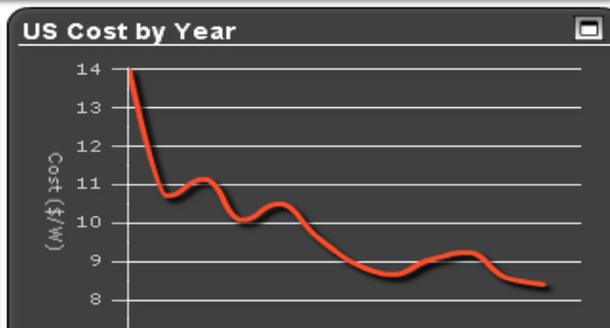
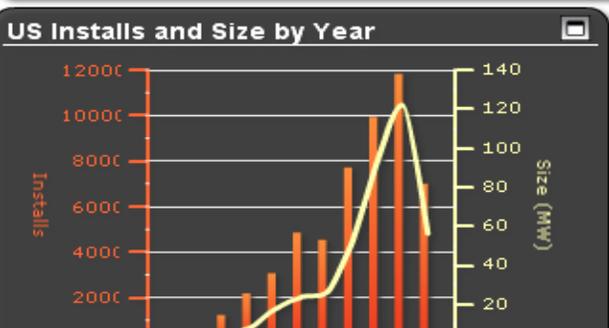
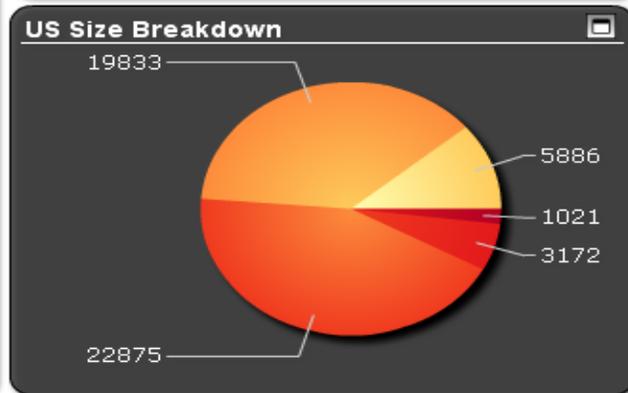
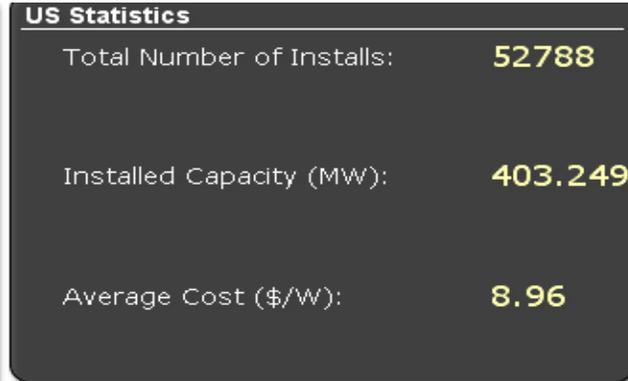
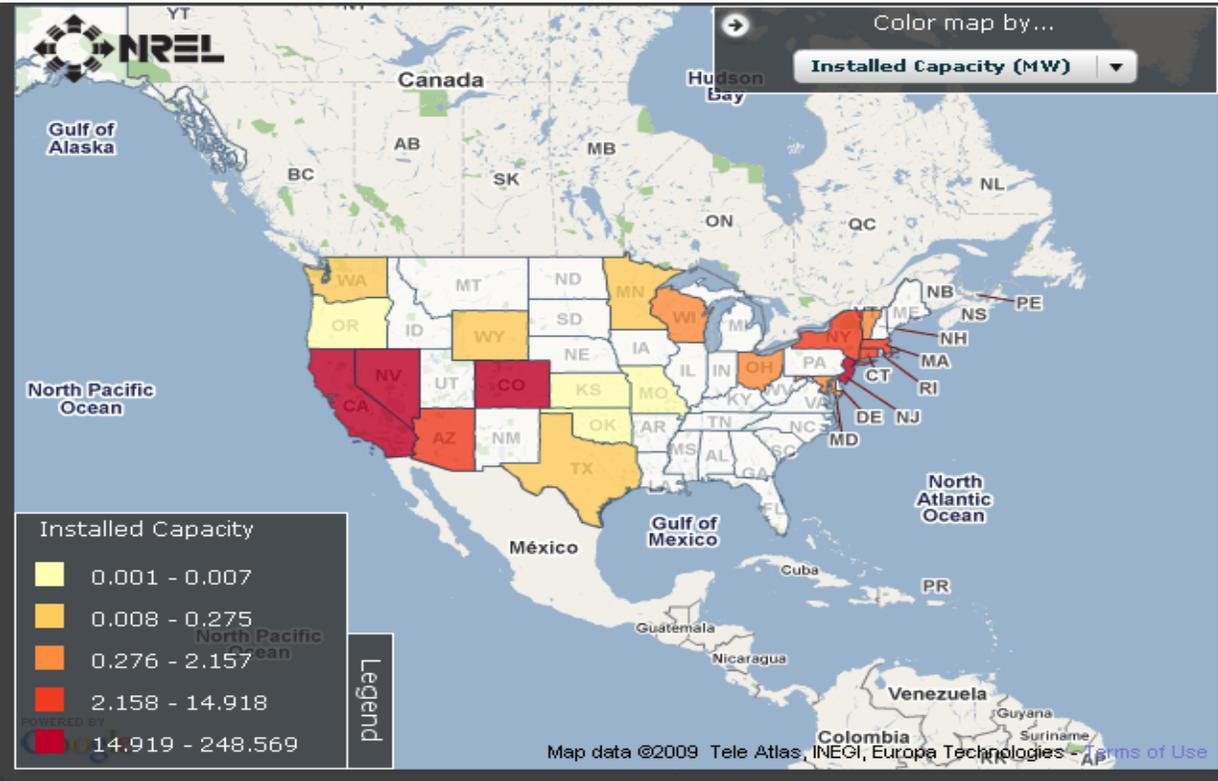


Annual average solar resource data are shown for a tilt=latitude collector. The data are a 10km satellite modeled dataset (SUNY/NREL, 2007) representing data from 1998-2005.



# OpenPV – PV Capacity Tracking

<http://openpv.nrel.gov/>



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## To learn more:

Renewable Energy Report under “Renewable Energy” at:

[www.michigan.gov/mpsc](http://www.michigan.gov/mpsc)

**Sunshot** - <http://www1.eere.energy.gov/solar/sunshot/>

NREL OpenPV - <http://openpv.nrel.gov/>