

Solar Energy For Michigan

Midland Solar Applications

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Solar Electric Production Advantages

- Solar will be the lowest cost energy source – Achieved by continued technology advances coupled with streamlined installation processes.
- Solar is the most abundant source of energy – the sun puts more energy on the earth in one hour than mankind uses in one year.
- Compliments Peak Load demand
- Solar energy is renewable
- Solar energy is emission free and not polluting
- Solar is distributive. Available anywhere on earth with little distribution costs and energy losses .
- Solar power generation requires very little maintenance.
- Solar power requires no fuel costs and fuel transportation.
- **Michigan needs a sustainable distributed customer owned solar strategy to take advantage of this important source of electrical energy**



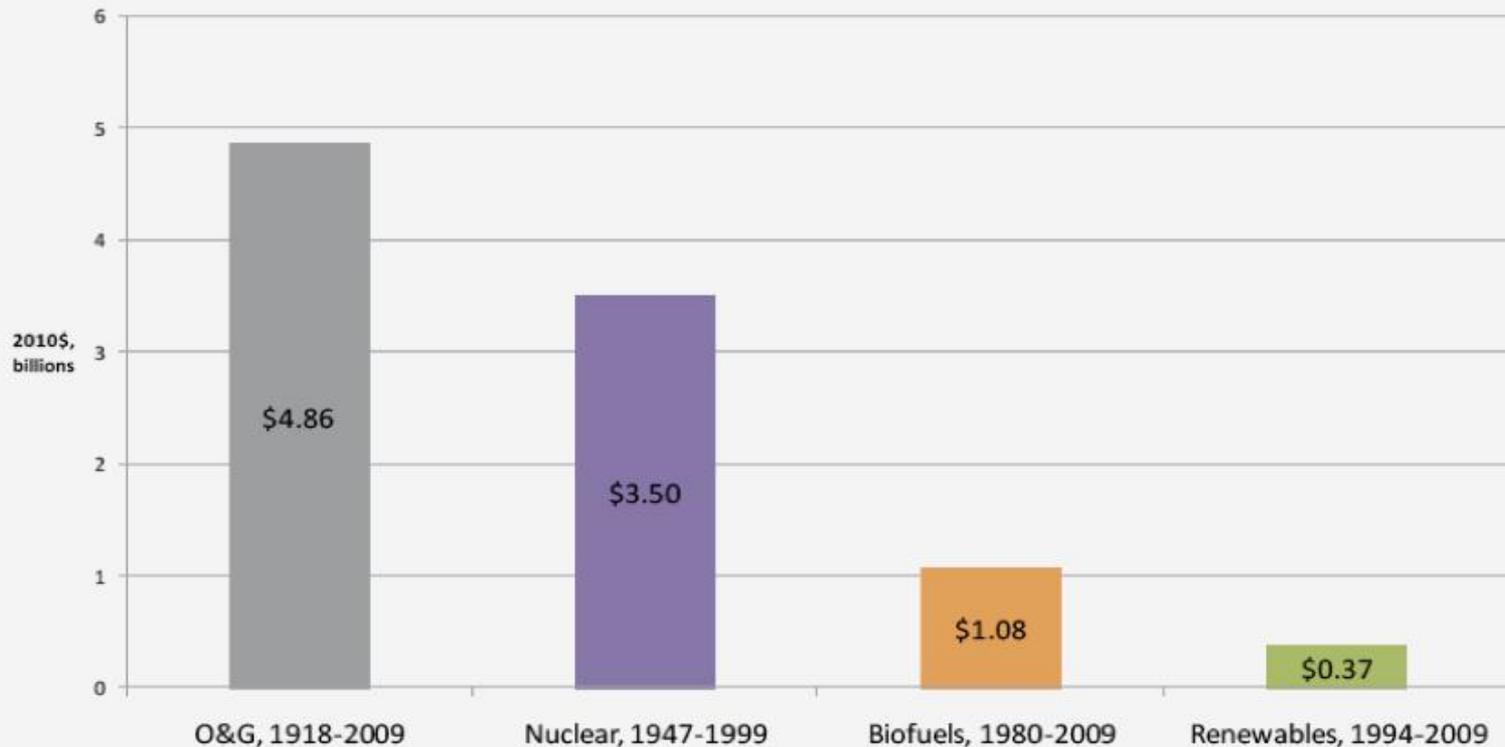
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• **Facts about Solar Power in Michigan**

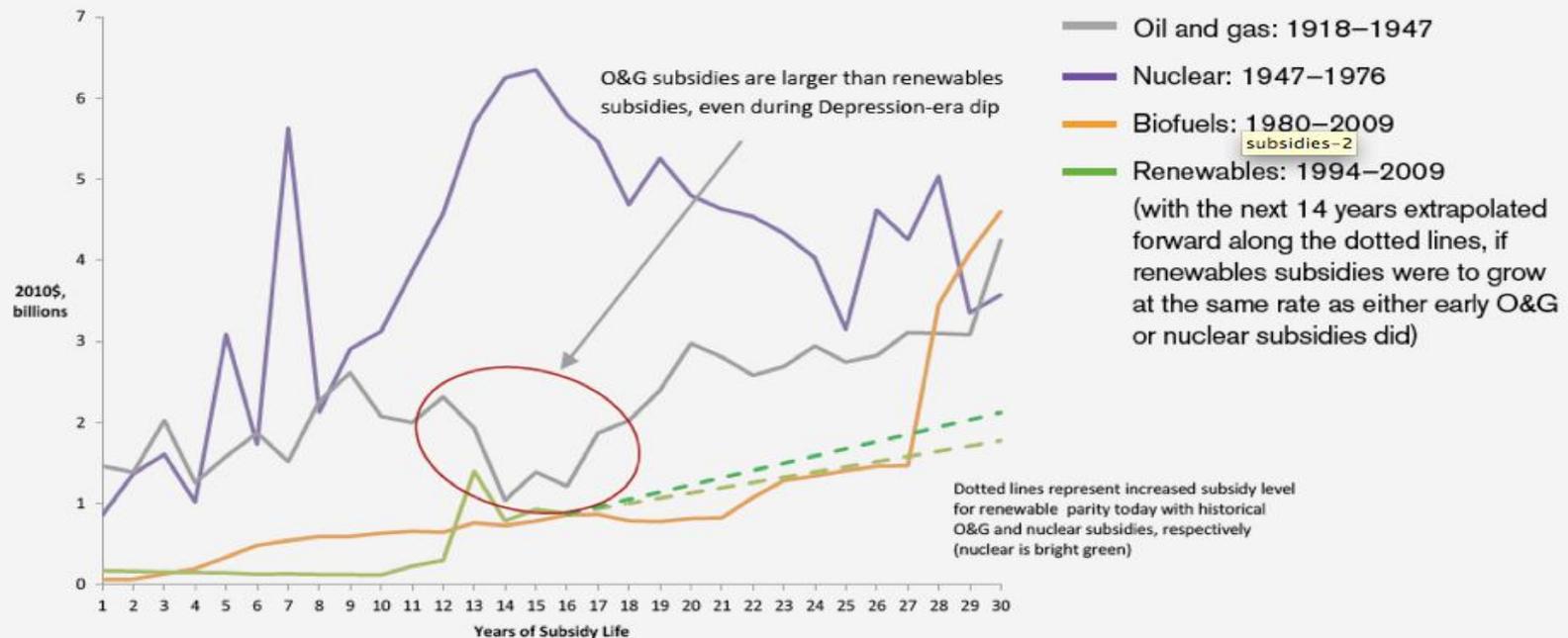
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- Solar manufacturing in Michigan generates \$1.6 billion in annual economic activity in the state
 - This is manufacturing only, and does not include the economic impact of solar deployment or research and development
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- Michigan is home to 121 identified solar power supply chain businesses
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- Michigan gets significantly more sunlight than Germany, the world leader in solar deployment
 - Germany gets on average approximately 1200 kWh/ m²/ year, while Michigan gets on average approximately 1600 kWh/ m²/ year.
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- Hemlock Semiconductor is the world's largest manufacturer of polycrystalline silicon
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- Installed solar in Michigan increased six-fold between 2009 and July 2012
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- Despite Michigan's growth in installed solar capacity, it continues to lag well behind leading states, as well as other Midwestern states
 - Michigan's total installed solar capacity at the end of 2011 was 8.8 MW
 - In comparison, Ohio had installed a total of 31.6 MW, Illinois had 16.2 MW and Wisconsin had 12.9 MW
 - Nationally, California leads all states with 1563.6 MW of installed capacity – 177 times the capacity of Michigan!
 - Other leading states include New Jersey (566 MW), Arizona (398 MW), Colorado (197 MW), New Mexico (165 MW) and Pennsylvania (133 MW)
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- Installed photovoltaic capacity nationwide doubled between 2010 and 2011
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- Costs for installed solar have been rapidly declining, falling from \$11/ W installed in 1998 to less than \$4/ W installed in the first six months of 2012
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- We will soon reach the point at which it is cheaper for homeowners and businesses to generate their own electricity from solar panels than it is to get it from their utility (known as socket parity)
 - While a number of factors affect when socket parity will be achieved, it will happen within the timeframe covered by the decisions stemming from the current data gathering exercise

Subsidies for Renewables Lags Those Given to Other Energy Sources

subsidies
**Historical Average of Annual Energy Subsidies:
A Century of Federal Support**



Comparison of Early Federal Subsidies to Energy Sectors



The analysis was conducted by Nancy Pfund, a managing partner at DBL Investors of San Francisco, and Ben Healy, a Yale graduate student and former staff director for the Massachusetts legislature’s environment and natural resource committee. Pfund and Healy say — as far as they know — they’re the first to quantify exactly how the current federal commitment to renewables compares to support for earlier energy transitions.

Current Michigan Program Lack of Transparency

- **What did Utility Customers get for the Renewable Energy Surcharge??**
- Utilities collected a total of \$480,000,000 dollars in renewable energy fees from customers
- At the end of 2011 Michigan had 8.8MW of Solar Energy – This is little return for Investment!
 - Example: Utility Owned: Mercy High School Bid \$6.25/W
- Current program of lottery is not a sustainable program.

Suggested More Efficient Use of Money

- If we had spent the \$480,000,000 on Solar
- And if we have a \$2/W Incentive, that would result in installation of 240MW fully paid for.
- Would Employ 2,380 FTE, just in the design and install portion of the supply chain. Does not include materials. (Real companies used to determine the number of employees per revenue generated)

EXAMPLES OF DTE OWNED COSTS

Partner	Location	Generation Capacity	More Information
	Detroit Hamtramck Assembly Plant, Wayne County	516 kW	Press release See Output
	Orion Plant, Oakland County	345 kW	See Output
	Michigan Assembly Plant on Michigan Avenue, Wayne County	502 kW 6.00/watt	Press release See Output
	BCBS parking garage roof, downtown Detroit, Wayne County	220 kW 5.00/watt	Press release See Output
	Monroe County Community College campus in Monroe, Monroe County	513 kW 6.00/watt	Press release See Output
	Mercy High School roof, Farmington Hills, Oakland County	394 kW 6.29/watt	Press release See Output

The State of Michigan Is Not Competitive With Other States

- 19 States have a solar carve-out (2% or more of the renewable energy portfolio has to be Solar) as a part of their renewable energy portfolio. (Examples include Missouri, Pennsylvania, New Jersey, Arizona, Colorado, etc) – Michigan does not
- 28 States have sales tax incentives – Michigan does not
- 18 States have rebate programs for renewables – Michigan does not
- 37 States have property tax incentives (Michigan ended year-end 2012)

Our Company Performance

Michigan VS Missouri

Year	2010 (FTE/Rev)	2011 (FTE/REV)	2012 (FTE/REV)	2013 Est. (FTE/REV)
Midland Solar	1/\$61,000	4 / \$440,000	3 /\$300,000	1/\$100,000
Missouri Solar	2/50,000	8/\$1,800,000	22/\$4,200,000	35/\$7,000,000

Reasonable Energy Strategy

- Focus on Natural Gas Development (However, there much greater value in using Natural Gas for down stream products)
- Continue: Coal, Hydro, Wind ETC.
- Establish Sustainable Presence in Solar Energy to take advantage of the energy source when it becomes the lowest cost option

How to Enhance the Role of Solar to Accomplish Renewable Mandates

- **Consistent** and Sustainable Solar Program
 - A **consistent** solar program provides a demand base leading to continued employment while giving utilities a better planning basis for meeting Michigan energy needs
 - **Consistent** demand leads to greater cost reductions through learning curve and economy of scale improvements
 - **Consistent** demand would support Michigan Solar Industry Capital Investments