

## Komatsu Mining Corporation – Estimated Solar Array Evaluation

# 1,836,277 kWh/Year\*

System output may range from 1,732,711 to 1,922,950 kWh per year near this location.

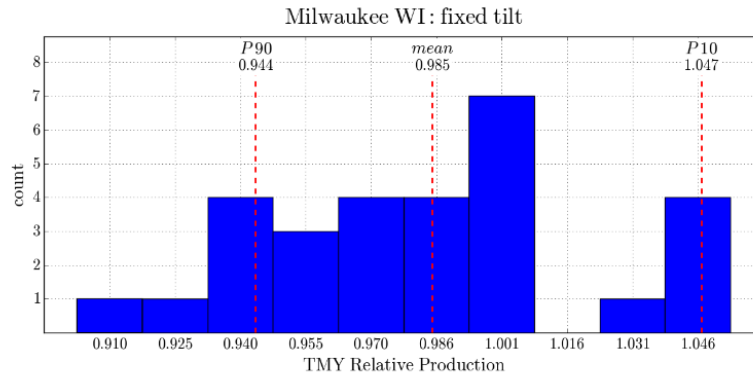
Month	Solar Radiation ( kWh / m <sup>2</sup> / day )	AC Energy ( kWh )	Value ( \$ )
January	2.99	107,255	9,653
February	4.06	129,378	11,644
March	4.73	161,466	14,532
April	5.23	168,360	15,152
May	5.68	186,883	16,820
June	6.27	195,374	17,584
July	6.47	205,372	18,484
August	5.83	183,645	16,528
September	5.41	168,351	15,152
October	4.23	140,752	12,668
November	3.06	103,139	9,282
December	2.45	86,303	7,767
<b>Annual</b>	<b>4.70</b>	<b>1,836,278</b>	<b>\$ 165,266</b>

**User Comments**

90,000 sq. ft. for manufacturing and 45,000 sq. ft. for parking lot - top level

### Interannual Variability for Milwaukee, WI

Year-to-year variations in solar radiation mean that some years your system will produce more or less energy than the typical year. Based on 30 years of historical weather data for nearby , Wisconsin, which is 5 miles from your selected location, a Fixed (open rack) PV system has a 90% likelihood of generating at least 94% of a typical year's production. Similarly, it has a 10% chance of generating more than 105% the typical year's output. A typical year's energy output is based on the Typical Meteorological Year (TMY) 2 data set. A histogram of generation from all historical 30 years for Milwaukee, WI is shown below.



For further information on interannual variability, please consult:

Ryberg, D. S., Freeman, J., Blair, N.; "Quantifying Interannual Variability for Photovoltaic Systems in PVWatts". NREL Technical Report, forthcoming, 2015.

Dobos, A., P. Gilman, and M. Kasberg. "P50/P90 Analysis for Solar Energy Systems using the System Advisor Model." World Renew. Energy Forum, Denver, CO, USA. 2012.

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Location and Station Identification	
Requested Location	43.014081,-87.907111
Weather Data Source	Lat, Lon: 43.01, -87.9 0.7 mi
Latitude	43.01° N
Longitude	87.9° W
PV System Specifications <i>(Commercial)</i>	
DC System Size	1332 kW
Module Type	Premium
Array Type	Fixed (open rack)
Array Tilt	30°
Array Azimuth	180°
System Losses	14.08%
Inverter Efficiency	96%
DC to AC Size Ratio	1.2
Economics	
Average Retail Electricity Rate	0.090 \$/kWh
Performance Metrics	
Capacity Factor	15.7%

\* Caution: The PVWatts<sup>®</sup> energy estimate is based on an hourly performance simulation using a typical-year weather file that represents a multi-year historical period for Milwaukee, WI for a Fixed (open rack) photovoltaic system. The kWh range is based on analysis of a nearby data site described

Note: The estimate for the value of this energy is the product of the AC energy and the average retail electricity rate. This value is useful for basic comparisons but does not account for financial considerations in a cash flow-based analysis. All of these results are based on assumptions described in that may not accurately represent technical or economic characteristics of the project you are modeling.

Source: PVWatts<sup>®</sup> is a registered trademark by Alliance for Sustainable Energy, LLC in Golden, CO, 80401.V 6.1.1

Web Site: <https://pvwatts.nrel.gov/pvwatts.php>

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