[redacted]

DESIGN ENGINEERS, INC.

[redacted]

November 29, 2016

[redacted]

RE: [redacted] ***- Technical Performance Review & Data Assessment***

Dear Mr. Kim:

[redacted]) is pleased to submit this technical review letter and associated supporting documentation presenting our data assessment of the effect of panel cleaning and [redacted] application on solar panel performance at the above referenced site. Individual panel monitoring data was evaluated from the [redacted], California, a solar panel project with over five months of data available from the implementation of [redacted] treated panels.

BACKGROUND

[redacted] LLC has developed a proprietary [redacted] photocatalyst technology designed to improve solar panel operating efficiencies. [redacted] echnology incorporates a proprietary photocatalyst customized for use in photovoltaics. When solar panels are cleaned in conjunction with the multi-layered titanium oxide (TiO_2) application the panels passively develop a passive self-cleaning hydrophilic attribute which [redacted] represents as improving solar panel operating performance (PV production) over time.

[redacted] based commercial solar electric design and installation firm. In 2012, [redacted] parent company [redacted] completed the installation of a 27.72 kW DC solar array consisting of 90 solar panels on a carport structure at their [redacted] location in [redacted], California. The system layout includes Sunpower E18 308W 96-cell panels installed with Enphase microinverters, allowing for individual monitoring of individual solar panel production and performance. Pictures of the installed array are included in Appendix A.

[redacted]

[redacted] LLC with the consent of [redacted] and [redacted] cleaned the solar panels prior to treatment and applied the [redacted] treatment technology to 30% of the existing installation to allow for a comparison of the energy production levels between the newly cleaned and treated panels to the untreated panels.

[redacted] Application Narrative

[redacted] cleaned and applied the [redacted] on 30 of the overall ninety (90) solar panels installed on the [redacted] carport (3 rows of thirty (30) panels, see Aerial Site Plan). Cleaning and panel treatment applications were completed in April of 2016. The panel configuration and locations of the thirty (30) treated panels are identified within the supporting documentation attached to this letter.

Critical factors that affect solar panel performance include solar irradiance, temperature, shading, and panel soiling (dust, dirt and other debris). Key solar-related climate conditions for [redacted] California include:

Notable Climate Conditions		
	[redacted]	**United States Average**
Annual Rainfall	14.9 Inches	34.5 Inches
Precipitation	54 Days	100 Days
Sunny Days	261 Days	205 Days
Solar Irradiance – kWh/m²/day	5.1	---
Temperature (°F)	59.3	52.0

The panels are installed in a due south direction with a 5 degree horizontal pitch and no apparent shading from nearby trees or structures (see Aerial Site Plan in Attachment A).

The solar panels have been operating with no subsequent cleaning or maintenance of any of the panel surfaces since completion of the [redacted] applications in April of 2016.

Data Review – Solar Energy Production

[redacted] provided [redacted] with compiled Excel data sheets of the individual solar panel energy production for a five month period between May and September of 2016. The monitoring technology used to record production data is the Enlighten monitoring program developed by Enphase Energy. This open source technology monitors the electrical output of each of the ninety (90) individual Enphase microinverters and organizes data within a comma delimited file for customized exportable attributes.

After an analysis of data between treated panels and untreated panels, the average monthly solar panel energy performance levels for the May through September period were as follows:

Average Solar Panel Energy Production [redacted] *Treated vs Untreated*			
Time Period	[redacted] Treated Panels Avg. Production per Panel (kWh)	Untreated/Uncleaned Panels Avg. Production per Panel (kWh)	[redacted] Output Difference (%)
May 2016	41,117	35,378	16.22%
Jun 2016	45,748	39,228	16.62%
Jul 2016	44,580	38,098	17.01%
Aug 2016	37,702	31,988	17.86%
Sep 2016	30,983	26,105	18.68%
Avg.	**40,026**	**34,159**	**17.28%**

Summary energy production calculations, tables, graphs and associated graphics are attached to this letter.

Summary

Our data analysis indicates that, for the designated 5-month review period from May to September of this year, the cleaning and treatment of existing solar modules using the [redacted] technology yielded over a 17% increase in energy production in comparison with the untreated solar modules.

The comparison was completed for the aggregate energy production of all similar panels and did not review historic energy production levels and variances of individual panels as the individual panel daily performance data was not available at the time of our review.

The data directly suggests that the increase in efficiency and electrical output is statistically significant for panels associated with the direct panel surface cleaning and application of [redacted] technology as compared to panels that were not cleaned. In order to evaluate the degree the increased performance is attributable to the panel cleaning aspect, a data review of panels washed and cleaned without the subsequent [redacted] application is highly recommended.

In discussions with yourself, [redacted] has committed to providing the monthly solar panel performance data moving forward to allow this data review and assessment to be updated after a full year of operation. This will allow for assessment of a full annual cycle of seasonal performance data with respect to panel performance.

If you have any questions regarding this data analysis please call me at [redacted]

Very truly yours,

[redacted]

[redacted]

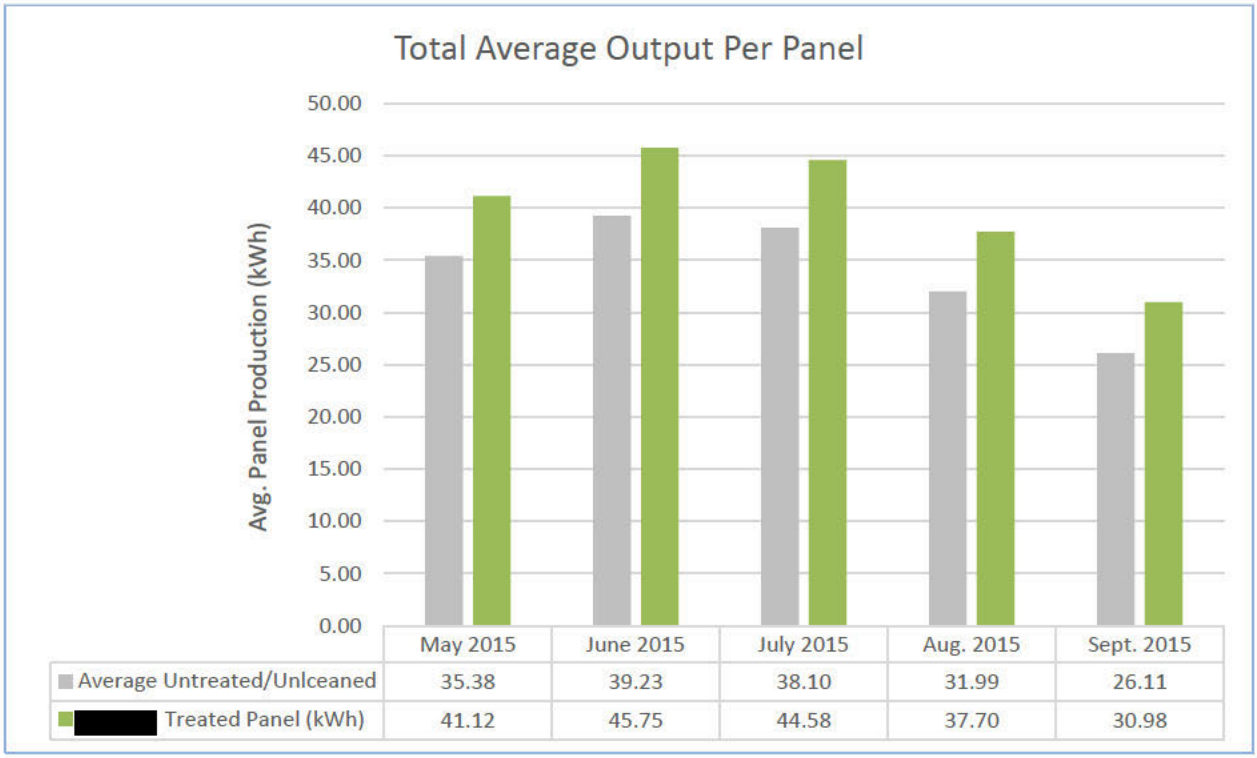
[redacted]
President

TABLES

Production Summary & Calculations

System Production Summary				
Time Period	Total System Production (Wh)	Outlier Production (4 Panels / Wh)	Treated Panels (29 Panels / Wh)	Untreated Panels (57 Panels / Wh)
16-May	3,281,038	72,070	1,192,404	2,016,564
16-Jun	3,688,544	125,832	1,326,688	2,236,024
16-Jul	3,582,462	118,042	1,292,823	2,171,597
16-Aug	3,018,772	102,082	1,093,364	1,823,326
16-Sep	2,468,103	81,583	898,510	1,488,010

Average Production – Treated VS Untreated			
Time Period	[redacted] Treated Production per Panel (kWh)	Average Untreated/Uncleaned Production per Panel (kWh)	Average [redacted] Power Increase (%)
May 2015	41.12	35.38	16.22%
Jun 2015	45.75	39.23	16.62%
Jul 2015	44.58	38.10	17.01%
Aug 2015	37.70	31.99	17.86%
Sep 2015	30.98	26.11	18.68%



Energy Production (Wh), Panel Location & Treatment Chart

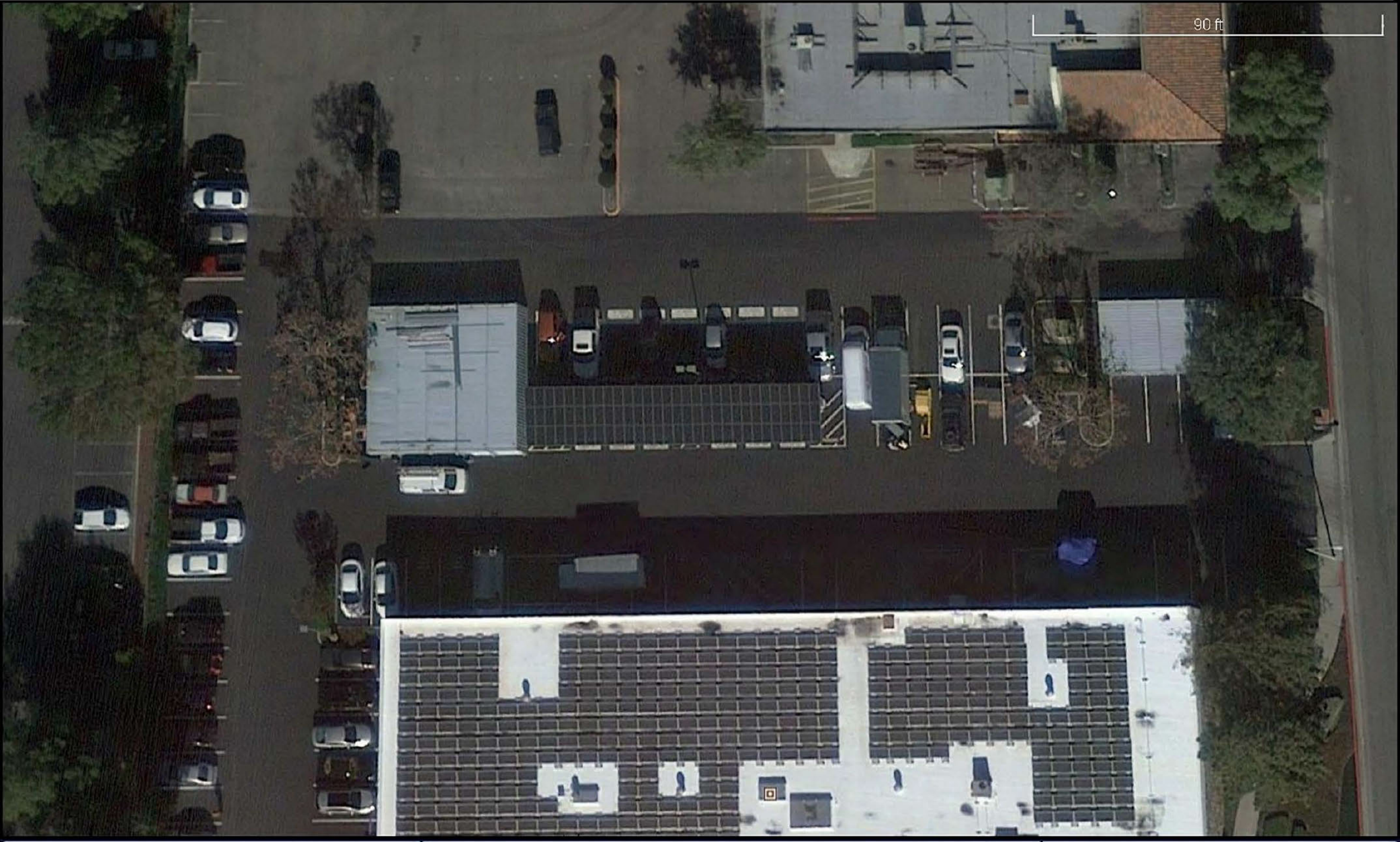
Serial Number	Location	Treated	May	June	July	August	September	Total Production
121127890945	10A	No	34,235	38,179	37,297	31,542	25,773	167,026
121127891094	10B	No	34,077	38,040	36,895	30,578	24,930	164,520
121127891322	10C	No	35,529	39,308	37,750	31,630	25,843	170,060
121127891022	11A	No	35,142	39,074	38,307	32,338	26,466	171,327
121127891375	11B	No	34,367	38,334	37,428	31,367	25,590	167,086
121127891069	11C	No	33,156	36,891	35,637	29,635	24,187	159,506
121127891315	12A	No	33,350	36,940	37,002	31,306	25,405	164,003
121122778811	12B	No	34,866	38,807	37,883	31,538	25,799	168,893
121127891061	12C	No	34,301	38,091	36,624	30,745	25,075	164,836
121323045468	13A	No	36,239	40,246	39,591	33,115	27,353	176,544
121410024953	13B	No	35,345	39,248	37,751	31,689	26,001	170,034
121127891450	13C	No	36,562	41,278	38,526	32,699	27,356	176,421
121124846286	14A	No	34,792	38,891	38,680	32,573	26,411	171,347
121122778728	14B	No	36,957	41,087	40,269	33,659	27,505	179,477
121127891423	14C	No	36,174	40,261	39,065	32,568	26,514	174,582
121124842049	15A	No	33,141	36,351	35,914	31,212	26,525	163,143
121122778713	15B	No	38,171	42,405	40,764	34,062	27,785	183,187
121127891454	15C	No	38,657	42,800	41,151	34,249	27,982	184,839
121124841473	16A	No	38,797	43,400	41,854	34,928	28,735	187,714
121122778973	16B	No	36,731	40,945	39,294	32,715	26,835	176,520
121127890954	16C	No	37,734	41,782	39,898	33,103	27,259	179,776
121124841760	17A	No	35,192	37,712	38,140	33,154	28,706	172,904
121122778976	17B	Yes	41,528	46,922	46,280	38,641	31,648	205,019
121127891032	17C	Yes	41,845	47,053	46,392	38,642	31,675	205,607
121124841963	18A	Yes	40,981	47,031	44,384	37,569	31,425	201,390
121122778928	18B	Yes	41,325	46,509	45,429	37,942	31,160	202,365
121127890848	18C	Yes	41,102	46,041	44,989	38,533	30,580	201,245
121124841589	19A	Yes	41,831	47,289	45,754	38,367	31,598	204,839
121122778978	19B	Yes	41,374	46,610	45,224	37,523	30,802	201,533
121127891417	19C	Yes	41,573	46,845	45,510	38,951	31,112	203,991
121124842052	20A	Yes	40,129	44,572	45,065	38,613	31,916	200,295
121122779225	20B	NA	40,248	1,255	30	22	-	41,555
121410024914	20C	Yes	40,570	45,568	44,894	37,231	30,823	199,086
121124841562	21A	Yes	40,843	45,985	45,297	38,095	31,520	201,740
121122778930	21B	Yes	41,053	46,245	45,260	37,746	31,017	201,321
121127890922	21C	Yes	40,839	45,739	44,716	37,321	30,262	198,877
121127891095	22A	Yes	41,033	46,751	45,889	38,526	31,567	203,766
121127891303	22B	Yes	42,351	47,199	45,945	39,450	31,995	206,940
121127891148	22C	Yes	40,822	45,828	44,696	36,943	30,307	198,596
121127891000	23A	Yes	41,443	46,893	46,399	39,198	32,479	206,412
121608026029	23B	NA	10,654	41,240	38,713	33,642	26,461	150,710
121608026556	23C	NA	11,154	43,625	41,654	35,691	28,926	161,050
121127891091	24A	Yes	40,777	45,227	44,679	37,772	30,955	199,410
121127891393	24B	No	35,348	39,125	37,669	31,584	25,667	169,393
121127890953	24C	No	33,520	37,087	35,728	29,790	24,228	160,353
121127891186	25A	Yes	40,858	44,982	44,570	38,732	30,690	199,832
121127890989	25B	No	38,256	41,311	41,122	35,156	21,710	177,555
121127891063	25C	No	36,313	40,259	38,697	32,115	26,100	173,484
121127890991	26A	Yes	40,815	44,841	44,817	38,445	31,596	200,514
121202372422	26B	No	35,549	39,251	38,470	32,026	26,339	171,635
121127891133	26C	No	34,541	38,336	37,247	30,802	25,023	165,949
121127890838	27A	Yes	39,244	43,820	43,382	38,286	30,649	195,381
121127891103	27B	No	36,719	40,408	38,738	32,456	26,484	174,805
121127891266	27C	No	35,667	39,575	37,953	31,526	25,688	170,409
121127890934	28A	Yes	41,088	45,800	44,695	38,338	31,513	201,434
121127891383	28B	No	38,035	41,983	40,388	33,557	27,284	181,247
121127891082	28C	No	37,471	41,557	39,791	33,138	27,235	179,192
121127890960	29A	Yes	41,209	46,322	45,026	38,007	31,418	201,982
121127891158	29B	No	37,228	40,926	40,031	33,441	27,199	178,825
121127891370	29C	No	38,170	42,452	41,253	34,148	27,894	183,917
121124841605	2A	No	32,406	38,072	37,405	32,272	26,743	166,898
121127890835	2B	No	35,769	39,879	39,298	33,057	26,890	174,893
121127891107	2C	No	35,414	39,380	38,716	32,280	26,344	172,134
121323045492	30A	Yes	41,288	46,320	44,870	37,833	31,001	201,312
121414032467	30B	Yes	41,352	46,172	45,023	37,718	31,174	201,439
121202372391	30C	Yes	40,726	34,726	28,643	25,414	24,180	153,689
121127891093	31A	Yes	41,734	46,929	45,326	38,337	31,334	203,660
121127891357	31B	Yes	41,259	45,892	44,517	37,363	30,746	199,777
121127890952	31C	Yes	41,412	46,577	45,152	37,828	31,368	202,337
121124841785	3A	No	35,939	39,363	39,076	33,324	26,885	174,587
121202372538	3B	No	36,076	36,143	28,935	25,769	23,987	150,910
121410024861	3C	No	35,627	39,467	38,489	32,166	26,460	172,209
121124841593	4A	No	34,766	39,042	38,248	32,086	26,121	170,263
121127890997	4B	No	36,132	39,957	38,701	32,715	26,943	174,448
121127891249	4C	No	36,190	40,084	38,938	32,535	26,578	174,325
121124841712	5A	No	33,152	37,456	37,116	31,320	25,423	164,467
121127891250	5B	No	34,791	38,516	37,872	31,905	25,987	169,071
121122778854	5C	No	35,853	39,942	39,125	32,784	26,808	174,512
121608026547	6A	NA	10,014	39,712	37,645	32,727	26,196	146,294
121127891098	6B	No	34,044	37,753	37,150	31,209	25,342	165,498
121122779094	6C	No	35,156	38,977	38,195	32,040	26,054	170,422
121124841709	7A	No	34,707	38,918	38,020	31,837	25,858	169,340
121127890994	7B	No	34,113	37,820	36,446	30,725	25,163	164,267
121122778904	7C	No	34,897	38,674	37,420	31,302	25,814	168,107
121124841425	8A	No	33,482	37,776	37,503	31,465	25,649	165,875
121127891108	8B	No	32,871	36,603	35,914	29,912	24,382	159,682
121122779144	8C	No	33,826	37,529	36,644	30,595	24,919	163,513
121124841719	9A	No	32,423	36,254	35,777	30,150	24,555	159,159
121127890949	9B	No	33,493	37,186	36,212	30,176	24,538	161,605
121127890840	9C	No	35,105	38,893	37,590	31,558	25,681	168,827

TOTALS (Wh)

Total Panels	Analyzed	May Total	June Total	July Total	August Total	Sept. Total	5 Month Total
90	86	3,281,038	3,688,544	3,582,462	3,018,772	2,468,103	16,038,919

FIGURE 1

Aerial



[redacted]

Aerial Image

[redacted] Solar Carport
[redacted] Application

[redacted]

FIGURE 2

Treated –vs–Untreated Panel Locations

Treated VS Untreated Panel Locations

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	13A	14A	15A	16A	17A	18A	19A	20A	21A	22A	23A	24A	25A	26A	27A	28A	29A	30A	31A
B	2B	3B	4B	5B	6B	7B	8B	9B	10B	11B	12B	13B	14B	15B	16B	17B	18B	19B	20B	21B	22B	23B	24B	25B	26B	27B	28B	29B	30B	31B
C	2C	3C	4C	5C	6C	7C	8C	9C	10C	11C	12C	13C	14C	15C	16C	17C	18C	19C	20C	21C	22C	23C	24C	25C	26C	27C	28C	29C	30C	31C

Treated Panels | Untreated Panels | Outliers

Serial Number	Location	Treated
121127890945	10A	No
121127891094	10B	No
121127891322	10C	No
121127891022	11A	No
121127891375	11B	No
121127891069	11C	No
121127891315	12A	No
121122778811	12B	No
121127891061	12C	No
121323045468	13A	No
121410024953	13B	No
121127891450	13C	No
121124846286	14A	No
121122778728	14B	No
121127891423	14C	No
121124842049	15A	No
121122778713	15B	No
121127891454	15C	No
121124841473	16A	No
121122778973	16B	No
121127890954	16C	No
121124841760	17A	No
121122778976	17B	Yes

Serial Number	Location	Treated
121127891032	17C	Yes
121124841963	18A	Yes
121122778928	18B	Yes
121127890848	18C	Yes
121124841589	19A	Yes
121122778978	19B	Yes
121127891417	19C	Yes
121124842052	20A	Yes
121122779225	20B	NA
121410024914	20C	Yes
121124841562	21A	Yes
121122778930	21B	Yes
121127890922	21C	Yes
121127891095	22A	Yes
121127891303	22B	Yes
121127891148	22C	Yes
121127891000	23A	Yes
121608026029	23B	NA
121608026556	23C	NA
121127891091	24A	Yes
121127891393	24B	No
121127890953	24C	No
121127891186	25A	Yes

Serial Number	Location	Treated
121127890989	25B	No
121127891063	25C	No
121127890991	26A	Yes
121202372422	26B	No
121127891133	26C	No
121127890838	27A	Yes
121127891103	27B	No
121127891266	27C	No
121127890934	28A	Yes
121127891383	28B	No
121127891082	28C	No
121127890960	29A	Yes
121127891158	29B	No
121127891370	29C	No
121124841605	2A	No
121127890835	2B	No
121127891107	2C	No
121323045492	30A	Yes
121414032467	30B	Yes
121202372391	30C	Yes
121127891093	31A	Yes
121127891357	31B	Yes
121127890952	31C	Yes

erial Number	Location	Treated
121124841785	3A	No
121202372538	3B	No
121410024861	3C	No
121124841593	4A	No
121127890997	4B	No
121127891249	4C	No
121124841712	5A	No
121127891250	5B	No
121122778854	5C	No
121608026547	6A	NA
121127891098	6B	No
121122779094	6C	No
121124841709	7A	No
121127890994	7B	No
121122778904	7C	No
121124841425	8A	No
121127891108	8B	No
121122779144	8C	No
121124841719	9A	No
121127890949	9B	No
121127890840	9C	No

APPENDIX A

Installation Photographs


NO PARKING
PARKING ONLY

APPENDIX B

Sunpower Data Sheet

SUNPOWER

E18 / 308 SOLAR PANEL

EXCEPTIONAL EFFICIENCY AND PERFORMANCE

BENEFITS

Highest Efficiency

SunPower™ Solar Panels are the most efficient photovoltaic panels on the market today.

More Power

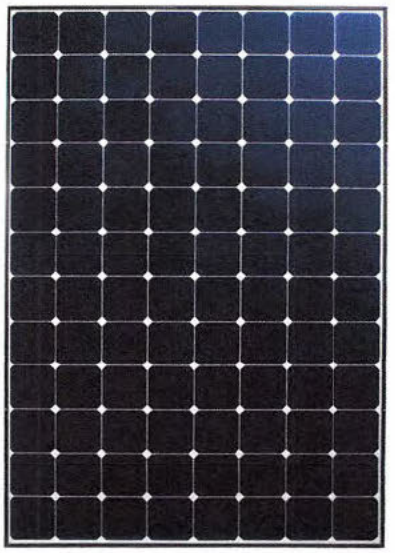
Our panels produce more power in the same amount of space—up to 50% more than conventional designs and 100% more than thin film solar panels.

Reduced Installation Cost

More power per panel means fewer panels per install. This saves both time and money.

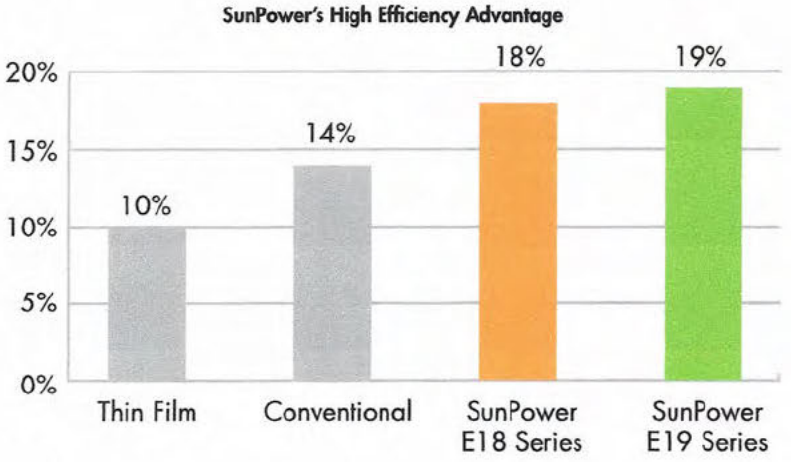
Reliable and Robust Design

Proven materials, tempered front glass, and a sturdy anodized frame allow panel to operate reliably in multiple mounting configurations.



E18 SERIES

The SunPower™ 308 Solar Panel provides today's highest efficiency and performance. Utilizing 96 back-contact solar cells, the SunPower 308 delivers a total panel conversion efficiency of 18.9%. The panel's reduced voltage-temperature coefficient and exceptional low-light performance attributes provide outstanding energy delivery per peak power watt.



SPR-308E-WHT-D

c UL us

SUNPOWER

E18 / 308 SOLAR PANEL

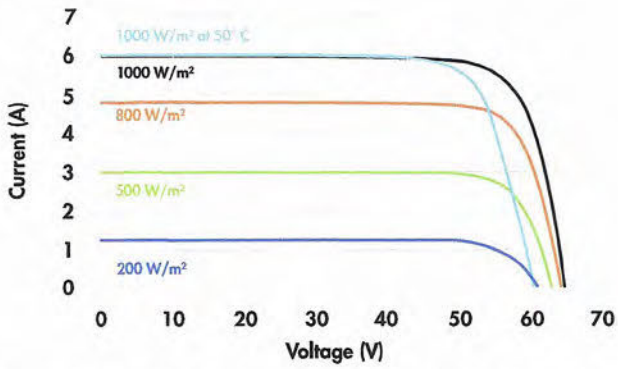
EXCEPTIONAL EFFICIENCY AND PERFORMANCE

Electrical Data

Measured at Standard Test Conditions (STC): irradiance of 1000W/m², AM 1.5, and cell temperature 25° C

Peak Power (+5/-3%)	P_{max}	308 W
Efficiency	η	18.9 %
Rated Voltage	V_{mpp}	54.7 V
Rated Current	I_{mpp}	5.64 A
Open Circuit Voltage	V_{oc}	64.3 V
Short Circuit Current	I_{sc}	6.02 A
Maximum System Voltage	UL	600 V
Temperature Coefficients	Power (P)	-0.38% / K
	Voltage (V_{oc})	-176.6mV / K
	Current (I_{sc})	3.5mA / K
NOCT		45° C +/-2° C
Series Fuse Rating		15 A

I-V Curve



Current/voltage characteristics with dependence on irradiance and module temperature.

Mechanical Data

Solar Cells	96 SunPower all-back contact monocrystalline
Front Glass	high transmission tempered glass
Junction Box	IP-65 rated with 3 bypass diodes
	Dimensions: 32 x 155 x 128 (mm)
Output Cables	1000mm length cables / MultiContact (MC4) connectors
Frame	Anodized aluminum alloy type 6063 (black)
Weight	41 lbs. (18.6 kg)

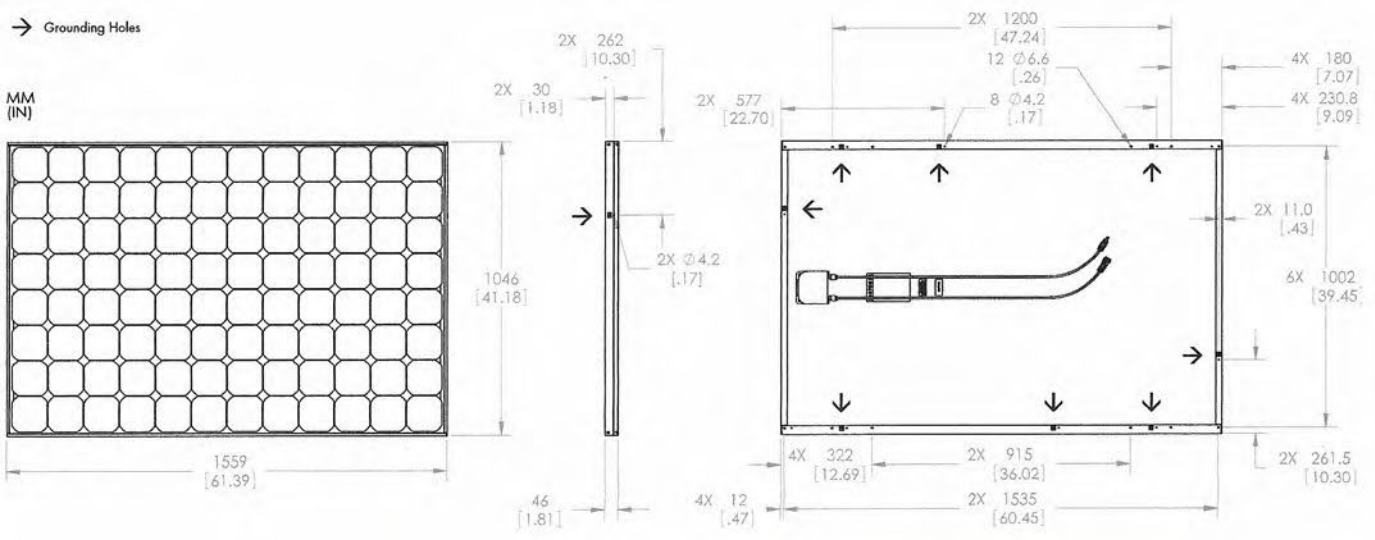
Tested Operating Conditions

Temperature	-40° F to +185° F (-40° C to + 85° C)
Max load	113psf 550 kg/m² (5400 Pa), front (e.g. snow) w/specified mounting configurations
	50 psf 245 kg/m² (2400 Pa) front and back – e.g. wind
Impact Resistance	Hail 1 in (25 mm) at 52mph (23 m/s)

Warranties and Certifications

Warranties	25 year limited power warranty
	10 year limited product warranty
Certifications	Tested to UL 1703. Class C Fire Rating

Dimensions



CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.
Visit sunpowercorp.com for details

sunpowercorp.com

Document #001-65243 Rev** / LTR_EN

APPENDIX C

Monthly Energy Production Reports

[e] Enlighten

Monthly Energy Production Report for SVM Carport

Enphase Energy maximizes your solar energy production and keeps you informed about your system. Your monthly energy report shows how your system performed and how much you contributed to offsetting the global carbon footprint.

Week	Peak Power	Energy Produced
05/01/2016 - 05/07/2016	17.0 kW	574 kWh
05/08/2016 - 05/14/2016	17.0 kW	718 kWh
05/15/2016 - 05/21/2016	17.3 kW	791 kWh
05/22/2016 - 05/28/2016	17.9 kW	823 kWh
05/29/2016 - 05/31/2016	16.3 kW	386 kWh
	May 2016 Total:	**3.29 MWh**
	Previous Month Total:	**2.85 MWh**
	Year to Date:	**11.6 MWh**

For more details on these production results, please visit your[redacted]

Your **Carbon Offset** for this month: 2.27 tons
You have offset the equivalent of: **58 Trees**

[e] Enlighten

Monthly Energy Production Report for SVM Carport

Enphase Energy maximizes your solar energy production and keeps you informed about your system. Your monthly energy report shows how your system performed and how much you contributed to offsetting the global carbon footprint.

Week	Peak Power	Energy Produced
06/01/2016 - 06/07/2016	16.4 kW	844 kWh
06/08/2016 - 06/14/2016	16.8 kW	890 kWh
06/15/2016 - 06/21/2016	18.0 kW	850 kWh
06/22/2016 - 06/28/2016	16.1 kW	853 kWh
06/29/2016 - 06/30/2016	16.2 kW	251 kWh
	June 2016 Total:	**3.69 MWh**
	Previous Month Total:	**3.29 MWh**
	Year to Date:	**15.3 MWh**

For more details on these production results, please visit your [redacted]

Your **Carbon Offset** for this month: 2.55 tons
You have offset the equivalent of: **65 Trees**

[e] Enlighten

Monthly Energy Production Report for SVM Carport

Enphase Energy maximizes your solar energy production and keeps you informed about your system. Your monthly energy report shows how your system performed and how much you contributed to offsetting the global carbon footprint.

Week	Peak Power	Energy Produced
07/01/2016 - 07/07/2016	15.8 kW	834 kWh
07/08/2016 - 07/14/2016	16.2 kW	811 kWh
07/15/2016 - 07/21/2016	15.7 kW	814 kWh
07/22/2016 - 07/28/2016	15.4 kW	799 kWh
07/29/2016 - 07/31/2016	14.7 kW	325 kWh
	July 2016 Total:	**3.58 MWh**
	Previous Month Total:	**3.69 MWh**
	Year to Date:	**18.8 MWh**

For more details on these production results, please visit your [redacted]

Your **Carbon Offset** for this month: 2.48 tons
You have offset the equivalent of: **63 Trees**

[e] Enlighten

Monthly Energy Production Report for SVM Carport

Enphase Energy maximizes your solar energy production and keeps you informed about your system. Your monthly energy report shows how your system performed and how much you contributed to offsetting the global carbon footprint.

Week	Peak Power	Energy Produced
08/01/2016 - 08/07/2016	15.1 kW	751 kWh
08/08/2016 - 08/14/2016	14.6 kW	724 kWh
08/15/2016 - 08/21/2016	14.6 kW	670 kWh
08/22/2016 - 08/28/2016	13.9 kW	615 kWh
08/29/2016 - 08/31/2016	13.9 kW	269 kWh
	August 2016 Total:	**3.03 MWh**
	Previous Month Total:	**3.58 MWh**
	Year to Date:	**21.9 MWh**

For more details on these production results, please visit your [redacted]

Your **Carbon Offset** for this month: 2.09 tons
You have offset the equivalent of: **54 Trees**

[e] Enlighten

Monthly Energy Production Report for SVM Carport

Enphase Energy maximizes your solar energy production and keeps you informed about your system. Your monthly energy report shows how your system performed and how much you contributed to offsetting the global carbon footprint.

Week	Peak Power	Energy Produced
09/01/2016 - 09/07/2016	13.9 kW	632 kWh
09/08/2016 - 09/14/2016	13.5 kW	589 kWh
09/15/2016 - 09/21/2016	13.1 kW	573 kWh
09/22/2016 - 09/28/2016	12.9 kW	557 kWh
09/29/2016 - 09/30/2016	12.0 kW	148 kWh
	September 2016 Total:	**2.50 MWh**
	Previous Month Total:	**3.03 MWh**
	Year to Date:	**24.4 MWh**

For more details on these production results, please visit your [redacted]

Your **Carbon Offset** for this month: 1.73 tons
You have offset the equivalent of: **44 Trees**

APPENDIX D

[redacted] Information Package

[redacted]

a green self-cleaning
nanotechnology company

Introducing

Nano SolarClean Photocatalyst Technology

[redacted] Panel Coating Improves Solar Absorption & Self-Cleans-Greatly Improving Your ROI and also extends the life of your PV Panels

....Protecting & Improving Your Investment

* *Industry reports say the lack of scheduled cleanings can cause solar panels to lose 15 - 35% of their efficiency and increase a solar cells pay back time by 3 - 5+ years.*

[redacted]

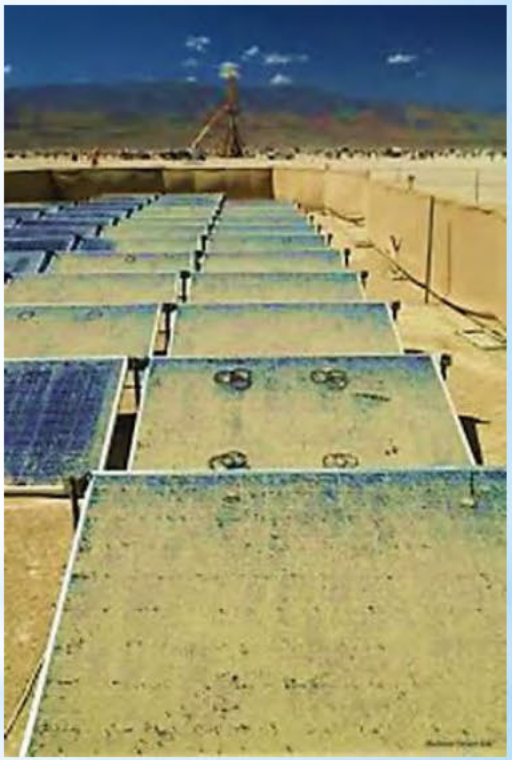
Practical Vs. Theoretical Efficiencies

- PV systems are designed based on the calculation of many variables that impact actual performance, i.e., profitability:
- One of the most common variables normally "assumed", (calculations are based on "perfect world" model) is the maintenance of the solar panels.

Factor	Assumption
Solar resources	Assumed solar availability: As per PV Watts
Soiling or contamination of the PV panels	Clean, washed frequently: 98% design sunlight transmission
Temperature	25C, calm wind
System configuration (battery or non-battery)	Non-battery
Orientation to the sun	tilted at your latitude, South facing
Shading	None
PV Energy delivered as % of manufacturers rating	95%
Wiring & power point tracking losses	9% (91% delivered)
Inverter Efficiency	90%
Total Energy Delivered	95% x 91% x 90% = 78%

Practical Affects on Efficiencies

- Without *on-going maintenance* of the PV panels:
  - PV system will lose between 10%-35% efficiency
  - Decreasing profitability and increasing time to ROI by years



Key Causes in Loss of Efficiencies

- **Pollutants:**
  - Carbon monoxide
  - Lead
  - Sulfur dioxide
  - Particulate matter/Pollens
  - VOCs
  - Nitrogen oxides

- **Bird Droppings**

  SEPA states that PV efficiency will decline up to 20% in areas where bird droppings are common.

- **Spotting and Fogging**

  Further impairs performance

Current Solutions

- Manual and Semi-automated washing
- In-house or outsourced service

19th & 20th century maintenance methods…are the current response to a to 21st Century Technology

Current Solutions -Problems

- On-going expenses
- Potential Run-off issues
- Unless continually maintained… starts losing efficiency immediately after cleaning
- Potential for damage from cleaning… mechanical and chemical

Amazing Properties of Photocatalyst Technology

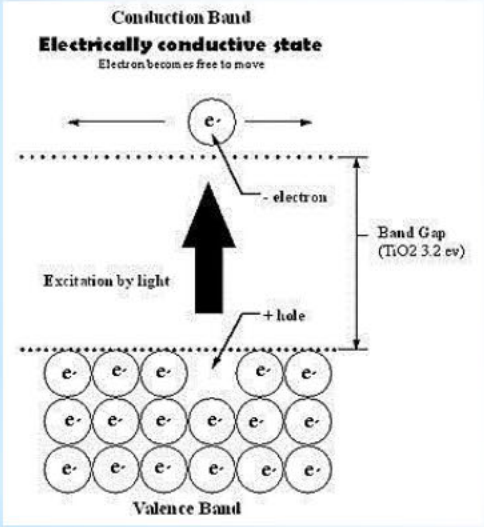
Photocatalysts are providing new benefits to existing products and are *LEED Certified* in certain applications

Nano Power: An Advanced Photocatalyst

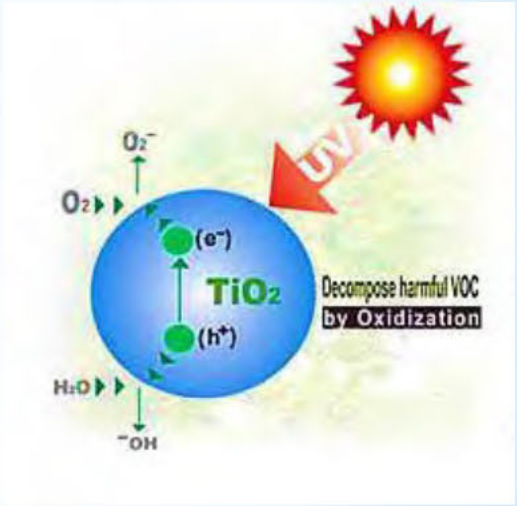
- ***What is a Photocatalyst?***
  - A substance that accelerates certain chemical reactions after being illuminated by light.
  - A photocatalyst itself is not consumed during the overall chemical reaction.
  - Photocatalysts are used as semiconductors for better control of a chemical reaction.
    - Example: Titanium Dioxide (TiO_2)

Photocatalytic Oxidation

When titanium dioxide (TiO2) absorbs UV radiation from sunlight or illuminated light source, it will produce pairs of electrons and holes (electron-hole pairs) and produces hydroxyl radicals [OH] and a superoxide anion [O2-1]



The energy difference between the valence band and the conduction band is known as the '**Band Gap**'. The positive-hole of titanium dioxide breaks apart the water molecule to form hydrogen gas and **hydroxyl radical**. The negative-electron reacts with oxygen molecule to form **superoxide anion**. This cycle continues when light is available



- **Effectively oxidizes chemical chain of airborne VOCs and toxic organic matter into carbon dioxide and water.**
- **Example: Carbon Monoxide, Acetone, Formaldehyde, Hydrocarbon, etc.**

[redacted] Protective Coating for Self-Cleaning Solar Panels

… just a loss of energy of 5 percent or more due to dirt can increase pay back an additional 3 to 5 years. [redacted] can substantially increase ROI.

[redacted]

[redacted] Offers: Significant cost savings, Maximum Solar Efficiency and Cleaner Air

- [redacted] Self-Cleaning Panels Key Properties
  - ***Antistatic***: Dust particles are no longer attracted to the surface.
  - ***Oxidation Strength***: The strong oxidizing effect will decompose hydrocarbons and any organic growth.
  - ***Hydrophilic Surface***: Any dust or contaminant can be easily washed off by rainfall or watering system.

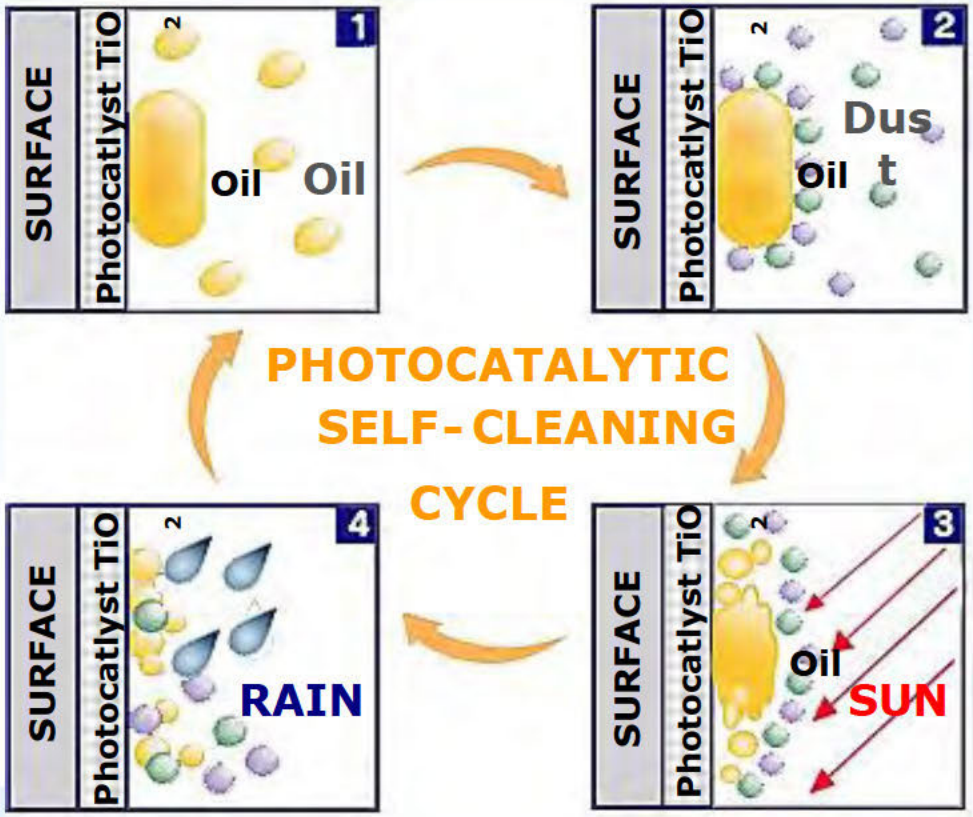
- [redacted] unique properties work together to:
  - **Resists buildup** and eliminates organic and inorganic airborne pollutants.
  - **Helps clean:** pollen tree sap, bugs, moss or other pollutants that can reduce PV output.
  - **Protects PV from** spotting, streaking, and fogging.

[redacted]

[redacted] Process

Large desert-based solar-energy installations provide abundant amounts of clean energy, but they often become coated in fine particles of sand, leading to a decrease in their efficiency.

The oil content from smog adheres to the [redacted] coated surface



Dust particles are attracted by oil content and deposited to the surface

After irradiated by light, [redacted] film oxidizes and breaks down the oil component and loosens dust deposit.

Loose dirt and oil are easily washed away by rain water

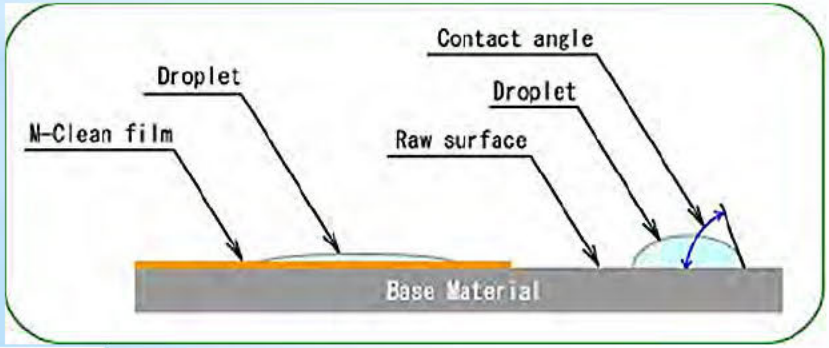
SUPER-HYDROPHILIC for all Climates

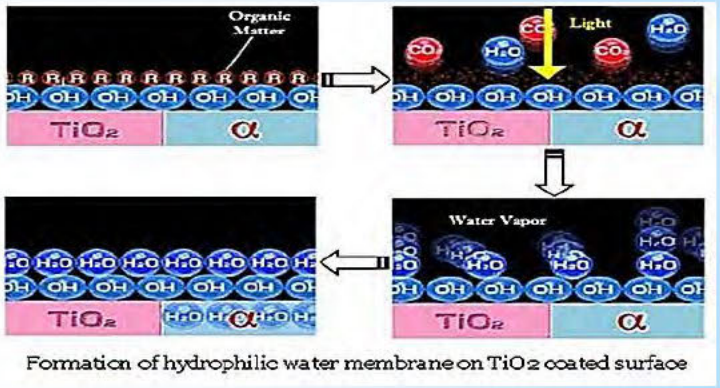
Resists Rain, Ice and Snow

[redacted] Uncoated

Uncoated [redacted]

When a [redacted] surface is exposed to light, the contact of the surface with droplets is reduced eventually reaching super-hydrophilicity… where water cannot exist in the shape of a drop, but spreads flatly over the surface of the PV panel in the form of a highly uniform thin film, which behaves optically like a clear sheet of glass.



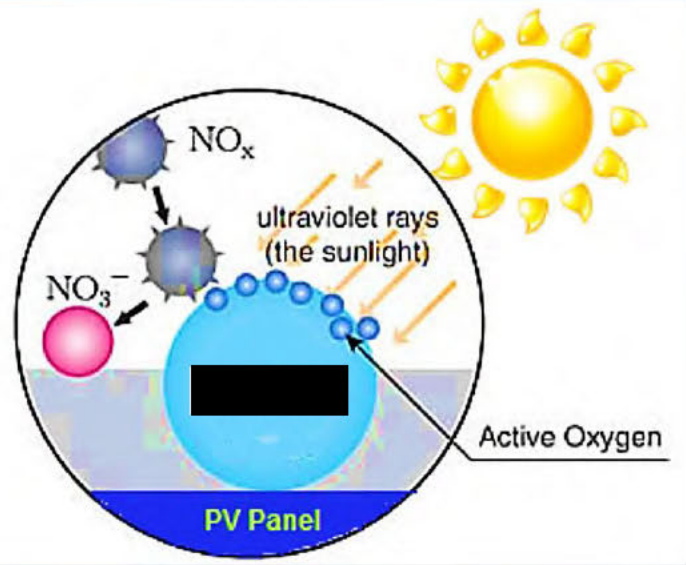


Formation of hydrophilic water membrane on TiO2 coated surface

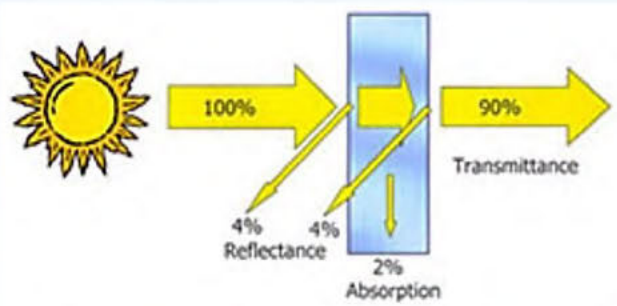
[redacted]

Three Green Benefits

Green Self-Cleaning = lower costs and maximum performance



Green Improved PV Output = increased profit, faster payback



[redacted] reduces light reflection and helps absorb more IR waves... in up to a 6% increase in PV panel efficiency.

Pollution Reducing = Environmental Benefits

NanoSC actually cleans the air by removing significant amounts of environmental pollutants deemed harmful to human health.

[redacted]

Nano Power Vs. Current Solutions

COST/BENEFIT	CONVENTIONAL	Robotic	[redacted]
Installation	NA	Usually Done after Solar Panel installation	✓ Done Prior
On-going Expense	Yes	Yes	✓ Reduced by 90% or more… if no rain, does require sprinklers
Warranty	NA	Limited warranties, 2-5 Years, potential mechanical costs repairs	✓ 20 Year Warranty recoat
On-Line	loses efficiency immediately after cleaning	Timer	✓ Continuous work… the hotter the sun… the better it works
Green	Potential Run-off issues	Potential Run-off issues	✓ Green AND cleans air
Insurance & Safety	Potential Safety Issues	Potential Safety Issues	✓ No human intervention or chemicals
Los of Incentives	Potential Warranty & SRECs loss if certain min. energy are not met or maintained.	Maintains compliance	✓ Maintains compliance
Extends PV Life	NO	NO	✓ YES
Improves Vs. Maintains Efficiency	NO	NO	✓ Improves PV Efficiency

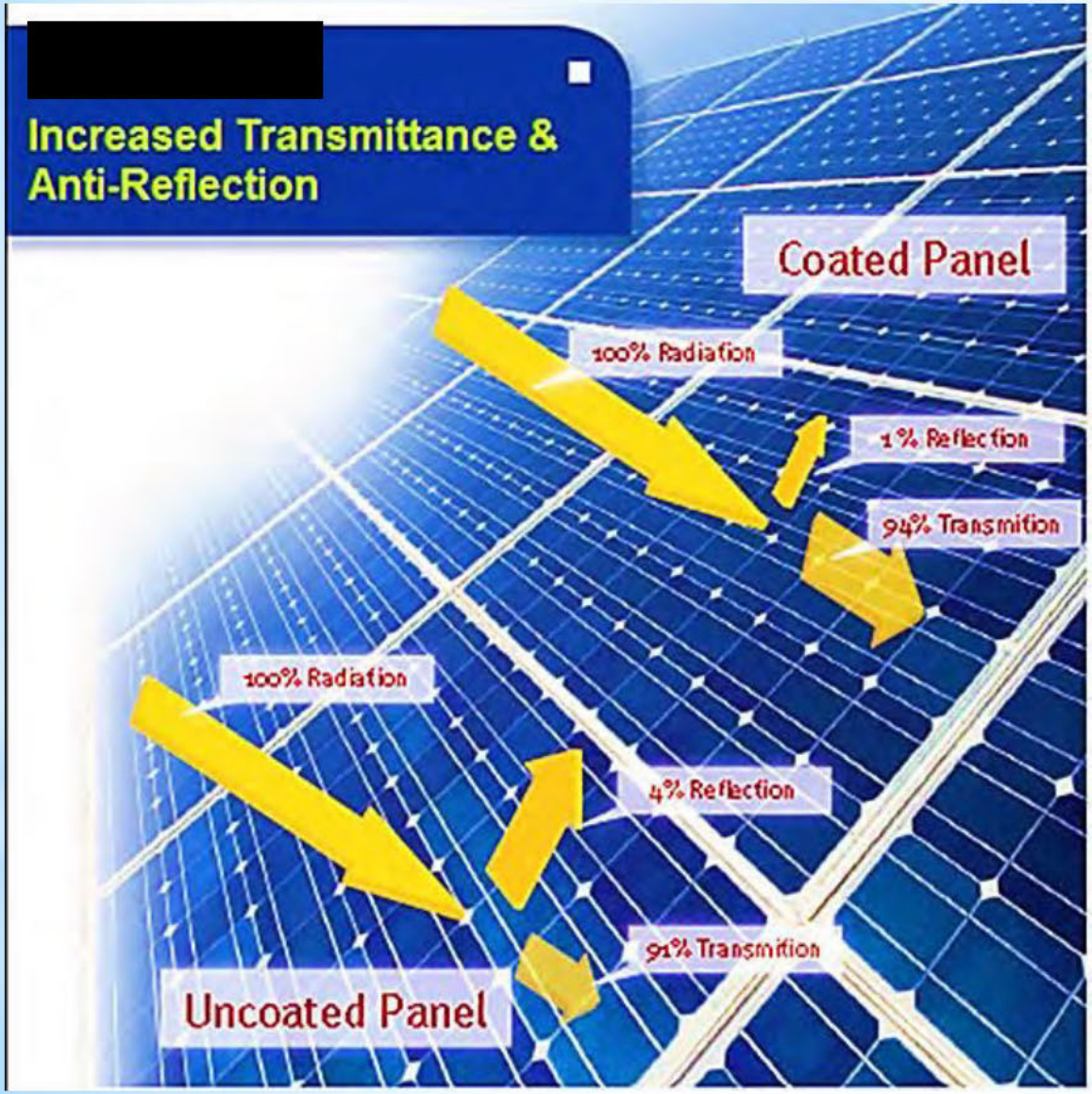
[redacted]

EXPENSE FACTORS Manual & Automated Systems:

- $ Typical solar cleaning services charge around $5.00/ panel
- $ Required monthly or more frequently for continued maintenance expense $5-$6 per panel
- $ The more panels… the greater the challenge to manage maximum efficiency
- $ Can increase insurance costs.
- $ Automated systems start around $.08-.30
- $ Automated systems…. Can break down….and expensive to repair

Cost: Direct vs. Indirect

Increase Rated Efficiency & Life



Increase Power

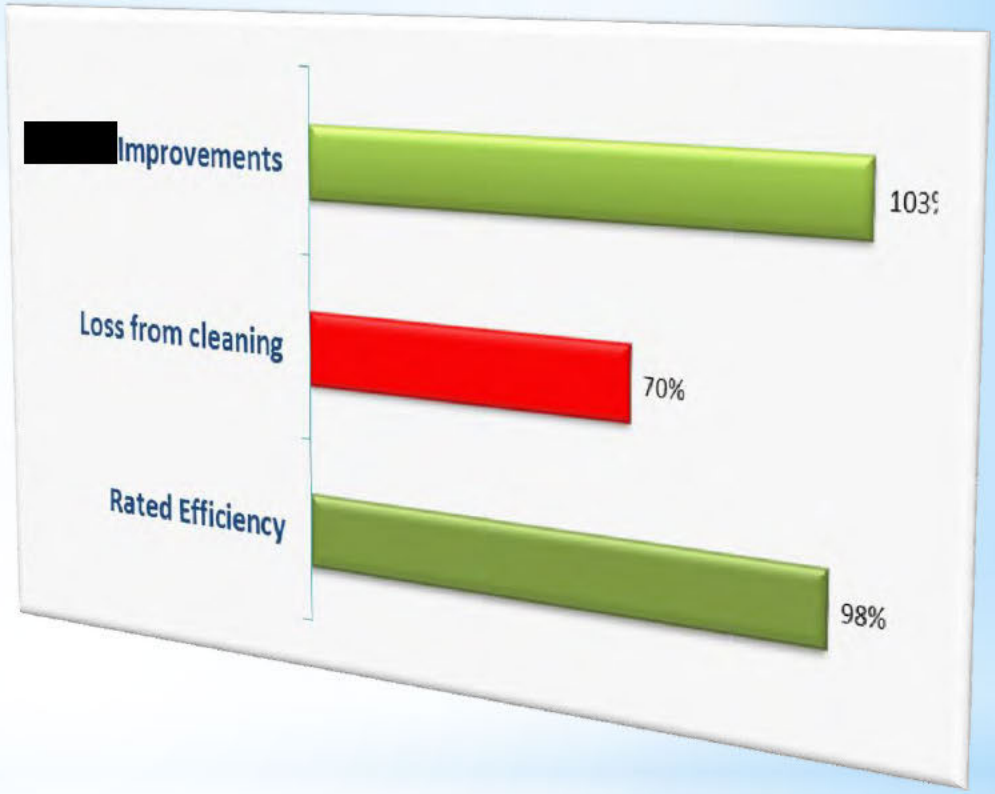
- Light transmittance increases by 5~6% vs. uncoated panel
- PV Cell Power generation is directly proportional to light intensity received
- Result = increased power generation

Increase Life

[redacted] provides protection from degradation of dye (DSSC) with increased protection against UV

Only [redacted] Provides:

- ✓ Increases visible-light transmittance 5-6%
- ✓ Increases power generation by up to 3%
- ✓ Increased cleanliness on solar cell surface after 1 year yields improved power generation by up to 7%
- ✓ Combining all of the savings can result in up to 55% increase in solar efficiency Year Working Life
- ✓ 20-25 Year Working Life



More Than Just Cleaning!

[redacted]

T.C.O. Warranty Year Comparison*

Assumptions: 1MW, 285 Watt Panels, 5000 Panels

ESTIMATED COSTS	Cleaning Service	Auto & Robotic	[redacted]
Installation Expense	$0.00	$0.02-$.30	$0.005/Generate Revenue[1]
Maintenance Expenses	$30.00	$0.0034	<$.01Depends on rainfall
Average Operating Efficiency**	80% depending on # of cleanings per month & envio conditions	90%-95% -depends # of washes and type of pollution	99%-103%**
Total Cost of Ownership ***	$30 + highest efficiency loss of 3 alternatives; if cleaned more often then 2-3x cost increase; insurance, potential damages, etc.	#2 in low costs, however, Warranty time short, cannot handle all pollutants on continuous basis	✓ Pays for itself from Day 1 ✓ Pays Out with Increased Power Gen ✓ Increase PV protection for longer optimal eff. ✓ Can be used with watering systems in low rainfall areas

[1] Installed per/watt cost over 20 years. However, increased efficiencies from cleaner panel, increased transmission and reduced reflectance will actually improve ROI compared to any other system. *This was calculated based on 285/watt panel size for materials and labor at $1.50/sf.*

*It is impossible to calculate actual numbers without all known variables related to a specific project/locations. However, we attempt a comparison using a relative scale: optimal working efficiency = 98% NanoSC 10 Year Full Warranty, Example Heliotex Auto: 2-5 years, calculated at their best case

**Airborne contamination is continuous causing PVs to loose efficiency immediately after washing. The amount of actual loss is impossible to calculate without all the known variables of a specific project/locations. However, we attempt a comparison using a relative scale: optimal working efficiency = 100% Clean 100% of the time.

*** [redacted] works under any sunlight. Potential 1% loss if not sufficient rain/watering to remove inorganics. However do to the additional IR NanoSC absorbs the PV efficiency increases, thereby negating any loss.

[redacted]

Keeping it Clean

You can keep on doing this:

Or let [redacted] + the Sun Keep your PVPs Clean & always working at top efficiency:

[redacted]

Your Bottom-Line

- ✓ Only Method *Increasing* Optimal Operating Efficiencies
- ✓ Only Method that *Improves* Environmental Conditions
- ✓ Reduce Maintenance Expense
- ✓ Improved Actual PV Output
- ✓ Extends Panel Life

All work to improve over all System Efficiency

Improved Profit & Faster ROI