# Town of Readfield

## 8 Old Kents Rd.,  Readfield, ME

Power Purchase Agreement Proposal

61.8 kW Ground Mounted Solar Photovoltaic System

Date: November 21, 2018

November 21, 2018

To Eric Dyer, Town Manager and the Readfield Town Select Board,

Dear Mr. Dyer & Select Board,

Sundog Solar greatly appreciates the opportunity to present you with a proposal for a town municipal solar electric system. We applaud your interest in securing lower cost power for the future and for standing out as a proactive town.

Through each stage of development, construction and operation we strive to deliver a high quality experience for our customers. All of our dedicated employees are eager to demonstrate our professionalism, expertise and the personal touch that sets us apart from our competitors.

The town is entertaining a powerful trend that is increasingly taking foothold here in Maine. Individuals, Businesses, Municipalities and Government agencies of all sizes are investing in solar energy. Through a Power Purchase Agreement (PPA), the town will begin seeing their return on investment the first year of operation. Our goal at Sundog Solar is to generate a win win agreement where the town experiences immediate cash flow savings and over the lifespan of the system hundreds of thousands in electrical savings. This path provides a way for the town to own it's power and to fix the towns electrical costs into the future. The solar electric installation will also position Readfield as a forward thinking and proactive community to live in and visit.

Thank you again for your time and consideration and we look forward to the possibility of helping the town go solar!

Sincerely,

Chuck Piper,
Owner
Sundog Solar LLC
207.505-5521
chuck@sundog.solar

We are recommending several manufacturers of solar equipment, but are open to alternatives as the town desires.

## Recommended Equipment

| | ***Equipment*** |
|---|---|
| *Inverter(s)* | (2) Solaredge, 43.3kW Commercial Inverters, 12 - year manufacturer warranty |
| *PV Modules* | (182) 340 watt Tier-1 modules, 25-year power output warranty and a 12 year manufacturer workmanship warranty |
| *Mounting System* | (18) Patriot Solar Group, Delta 2 High Ballasted Ground mounting system, 20-year manufacturer warranty |
| *Production Meter* | ( 1)SMA Data Manager with, Wattnode 3 phase Revenue Grade Meter and Cellular Data Connection |
| *Data Acquisition System* | SMA online monitoring system, Wifi TV located at town hall to stream PV production data to public |

## Adani 72 Cell, 340 Watt Photovoltaic Modules

### Tier 1 Photovoltaic Modules

The module we are recommending for your installation is the Adani ASM-7-AAA 340W. These tier one 340 watt monocrystalline modules are manufactured by Adani in India. Adani delivers high specific energy and efficiency at superior temperature coefficients. Andani's Anti LID Technology eliminates light induced degradation (LID) almost completely, preserving system performance over time.

## SolarEdge Inverters

We have been recommending and installing SolarEdge inverters and Power Optimizers for over seven years because of their advanced features and reliable performance. If any module is shaded the optimizer units located beneath each solar panel will allow them to operate independently thus minimizing any power loss. The performance of the array and individual modules is easily tracked with the free SolarEdge on line monitoring tool. This becomes important down the road if there is a need to replace an improperly performing module which would be under warranty. Revenue Grade meters will be installed on the system output to track production within .5% of actual production.

The inverter design we have selected for the project will integrate well with the 208V three phase service located at the site.

Additional Inverter Features:

- Integrated arc fault protection for NEC 2011 690.11
- Rapid Shutdown for NEC 2017 690.12

## Patriot Solar Group Delta 2 High Ballasted Ground Mount System

We will be using a ballasted solar ground mounting system designed and manufactured by Patriot Solar Group. This system delivers to the project location partially assembled, expediting construction installation efforts on site. The Delta is a non-penetrating ballasted ground mount system for any size solar installation. Benefits include several adjustment features for varying terrain as well as UL 467 integrated grounding mid clamps. The Delta is an ideal solution for landfills, brownfields, rocky soils, and impenetrable ground conditions.

## Proposed Photovoltaic System Design

Based on our review of the towns electric bills we have designed a 61.8 kW, DC capacity, photovoltaic system to offset a majority of the electrical consumption of the largest power using facilities. The system is designed to generate on average 74,256 kWh's per year. We have taken into account the highest usage bills that offer the most return on Net Energy Billing (NEB) kWh credits. We have included the town fire/police station into this equation as well as the town's wastewater treatment facility.

## Proposed Power Purchase Agreement Price Summary

| DC System Size | Estimated Performance Year 1 | Total Project Installed Cost | purchase price per kWh | Estimated electricity savings during first 6 years | Buyout purchase price year 7 | 30 Year Total estimated savings |
|---|---|---|---|---|---|---|
| **61.8 kW** | **74,256 kWh** | **$126,858** | **$.108** | **$ 13,690** | **$ 60,890** | **$ 226,573** |

Sundog Solar LLC will form Readfield Solar LLC once the town has agreed to enter into contract for the project.

The Town of Readfield will have the option to purchase the system at fair market value starting anytime after the end of year 6. The agreement is for a full 25 years and the town is not obligated to purchase the system at anytime throughout the agreement.

Beginning in year 7 the PPA agreement kilowatt hour price will track the current utility rate, up or down, with a 12.5% discount off of the current utility rate for each year forward. Our contract will specify that the town will purchase all of the electricity that the system produces.

Automatic billing will be established at a set rate per quarter based on annual generation spread over 12 months. At the end of a fiscal year, Sundog will reconcile the difference in kWh production from actual annual production and either bill for the remaining balance, or send a check to the Town of Readfield for the difference in kWh produced vs. charged monthly. We will use these production amounts to calculate quarterly billing for the town. The town will only be required in the contract to purchase "actual kWh produced from the system".

# Readfield Town PPA Exhibit 1

## Basic Terms and Conditions

**1. Initial Term:** Twenty five (25) years, beginning on the Anticipated Commercial Operation Date.

**2. Additional Terms**: One (1) Additional Term of five (5) years.

**3. Environmental Incentives and Environment Attributes:** Accrue to Seller. Seller may sell Environmental Incentives and Environment Attributes, including Renewable Energy Credits (RECs), to third parties.

**4. Contract Energy Price per kilowatt hour ($/kWh):** Purchaser hereby agrees, for the duration of this Agreement, to purchase energy generated by the System at the fixed energy price per kWh ($/k/Wh) set forth in the schedule below:

| Contract Year | Estimated Energy Production (kWh) | Fixed Energy Price per $/kWh |
|---|---|---|
| 1 | 74,256 | .108 |
| 2 | 73,885 | .108 |
| 3 | 73,513 | .108 |
| 4 | 73,142 | .108 |
| 5 | 72,771 | .108 |
| 6 | 72,400 | .108 |
| 7 | 72,028 | |
| 8 | 71,657 | |
| 9 | 71,286 | |
| 10 | 70,914 | |
| 11 | 70,543 | |
| 12 | 70,172 | |
| 13 | 69,801 | |
| 14 | 69,429 | |
| 15 | 69,058 | |

| | | |
|---|---|---|
| 16 | 68,687 | |
| 17 | 68,316 | |
| 18 | 67,944 | |
| 19 | 67,573 | |
| 20 | 67,202 | |
| 21 | 66,830 | |
| 22 | 66,459 | |
| 23 | 66,088 | |
| 24 | 65,717 | |
| 25 | 65,345 | |

* Beginning in year 7 and for each year thereafter (on a calendar year basis), the Fixed Energy Price per $/kWh will be established annually, equal to 12.5% less than the “Utility Rate” for the year.

The “Utility Rate” means the Central Maine Power Standard Offer electricity Rate for small non-residential service (including both the energy charge and delivery service) – as applicable to net energy billing eligible small general service (or if terminology changes, the equivalent as in effect at the time).

## Engineering

Engineering services for this project will include a ME PE stamped one line electrical diagram and a Master site map pointing out and describing all equipment locations. Sundog will also provide a ME PE stamped wind load assessment. These submissions shall be delivered based on a project schedule that is submitted and approved by Readfield.

## INSTALLATION

The Solar panels will be mounted on a ballast block system. This is a product offered by Patriot Solar Group out of Michigan that weighs the array to the ground through concrete blocks. We will use a 1” minus screened material as the foundation below each of the concrete ballast blocks. Each block is 3’ x 8’ x 10” and weighs

approximately 2,100 lbs. The system includes a total of 18 ballast blocks. Each block has a galvanized steel post holding up a truss to connect rail and panels to. We have included pictures of other ballast mounted systems we've installed with the same Patriot Solar mounting system.

The entire system will be built to the 2019 NEC code. We will include mesh fencing on the backside of the array to protect the public from the wiring on the panels. The inverters, Inverter AC disconnects and Inverter AC combiner panels will all be located on the backside of the front row of panels. The inverters will be hung on brackets to lift them off of the ground. All of the equipment being selected is industry proven high quality components.

## Workmanship warranty and Preventative Maintenance Plan

Since Sundog Solar will own the system for a minimum of six years. We will be 100% responsible for maintaining and operating the system during the entire lifetime of the PPA contract. If the Town purchases the system at the beginning of year 7, Sundog offers ongoing annual maintenance agreements. During the annual maintenance, all aspects of the solar PV system are checked to ensure proper efficient, and safe electrical generation. The solar panel array area will be monitored during this time for any changes to the system or signs of degradation. We will continue to facilitate the full manufacturer warranty on all products for the entire manufacture warrantied time frame.

## Product Warranty Summary

| | |
|---|---|
| Adani Solar Panels | 25 year linear performance warranty<br>12 year manufacturer's warranty |
| Solaredge 43.2 kW inverters | 12 year manufacturer's warranty |
| Patriot Solar ballasted ground mount | 20 year manufacturer's warranty |

## Anticipated Customer Experience:

Sundog Solar strives to provide an exceptional customer experience on every project. We accomplish this by communicating with clients about next steps, creating realistic expectations around the installation, and fulfilling on our agreements. Sundog Solar has learned from experience the importance of anticipating future project steps for large projects and holds status update meetings with the client to foster communication and aid in planning. The Sundog Solar team prides itself on completing projects on schedule and exceeding customer expectations.

## Sundog Solar Team and Certifications and Qualifications

| Name:<br>Danny Piper | With company since<br>2009 | Total years in solar industry: 9 |
|---|---|---|
| Applicable licenses/certificates held:<br><br>NABCEP PV Installation Professional since 2014<br>Certificate PV #100414-008102<br><br>NABCEP Solar Heating Installer since 2010<br>Certificate SH #110112-19<br><br>Universal Refrigeration Technician<br>Certification #799696687020<br>Maine State Electrical Helpers License since 2010<br>License #HP20036903<br><br>Maine State Propane & Natural Gas Technician License<br>License #PNT9939<br><br>Maine State Oil Up to 15 GPH & Solid Fuel<br>License #AP30016070 | | |
| Additional notes:<br>Owner, engineering, business operations | | |

| Name:<br>Chuck Piper | With company since<br>2009 | Total years in solar industry: 9 |
|---|---|---|
| Applicable licenses/certificates held:<br>NABCEP PV Entry Level Certification since 2009 | | |
| Additional notes:<br>Owner, sales and business operations | | |

| Name:<br>Bruce Farrell | With company since<br>2014 | Total years in solar industry: 4 |
|---|---|---|
| Applicable licenses/certificates held:<br>Maine State Master Electrician since 1980<br>License #MS60019070 | | |
| Additional notes:<br>Company Master Electrician has completed a 40-hour NABCEP PV installer certification course | | |

| Name:<br>Christopher Noyes | With company since<br>2017 | Total years in solar industry: 2 |
|---|---|---|
| Based out of (town):<br>Searsport, Maine | Applicable licenses/certificates held:<br>Journeyman Electrician's License #JY40092068 | |
| Additional notes:<br>Journeyman Electrician since 2016, has completed a 40-hour NABCEP PV installer certification course, served in the U.S. Marine Corps | | |

| Name:<br>Jacob Adams | With company since<br>2016 | Total years in solar industry: 2 |
|---|---|---|
| Based out of (town):<br>Searsport, Maine | Applicable licenses/certificates (including NABCEP) held:<br>Electrical Helpers License #HP20040194 | |
| Additional notes:<br>Lead installer and electrician helper. Has lived off grid with solar power for most of his life. | | |

| Name:<br>Will Quinn | With company since<br>2014 | Total years in solar industry: 5 |
|---|---|---|
| Based out of (town):<br>Prospect, Maine | | |
| Additional notes:<br>Lead Solar installer. Experience installing for multiple installation companies throughout the country from residential to industrial scale solar PV systems. | | |

| Name:<br>Jake McGinley | With company since<br>2013 | Total years in solar industry: 5 |
|---|---|---|
| Based out of (town):<br>Searsport, Maine | Applicable licenses/certificates held:<br>Refrigeration Type I Certification #84DE9AD44D447E1C0<br>Electrical Helpers License #HP20040578 | |
| Additional notes:<br>Holds a Bachelor's in Sustainable Energy Management from Unity College. Solar and Lead Mini-Split HP installer. | | |

| Name:<br>Lucas Bolduc | With company since<br>2016 | Total years in solar industry: 2 year |
|---|---|---|
| Based out of (town):<br>Searsport, Maine | Applicable licenses/certificates held:<br>Refrigeration Type I Certification #84DE9AD44D447E1C0 | |
| Additional notes: Solar installer and Mini-split HP installer | | |

| Name:<br>Steve Byers | With company since<br>2016 | Total years in solar industry: 8 |
|---|---|---|
| Based out of (town):<br>Belfast, Maine | | |
| Additional notes: Solar installer currently living off grid with solar power, installed panels on grid scale arrays in Vermont and Pennsylvania prior to moving to Maine | | |

| Name:<br>Jonathan Freedner | With company since<br>2016 | Total years in solar industry: 2 |
|---|---|---|
| Additional notes: Solar Design and Sales specialist. Holds an associate's degree from Central Maine Community College in electromechanical technology. | | |

| Name:<br>Brian Hughes | With company since<br>2017 | Total years in solar industry: 2 |
|---|---|---|
| Additional notes:<br>Solar Design and Sales specialist. Lives in a solar-powered house in Belfast Cohousing, holds a bachelor's degree in landscape architecture from the University of Maryland (CumLaude) wher he also, taught sustainable agriculture at the Institute for Applied Agriculture | | |

| Name:<br>Violet Zerbe | With company since<br>2017 | Total years in solar industry: 1 |
|---|---|---|
| Additional notes:<br>Solar Design and Sales specialist, office administrative support. Has a Bachelors of Science degree in Social Policy and Environmental Science from Northwestern University. | | |

| Name:<br>Sarah Lozanova | With company since<br>2017 | Total years in solar industry: 5 |
|---|---|---|
| Additional notes:<br>Marketing support, lives in a solar-powered house in Belfast Cohousing, also an instructor for Unity College, holds an MBA in sustainable business. | | |

| Name:<br>Judy Hatch | With company since<br>2016 | Total years in solar industry: 2 |
|---|---|---|
| Additional notes:<br>Sundog Solar Bookkeeper. Prior to working with Sundog Solar Judy has had a 30 year career with 4 different small business across the country. | | |

## Sundog References

### Town of Stockton Springs

Sundog Solar installed a solar system on the town garage to offset power for the town offices, public works garage, harbor, fire station, and ballpark.

| | | | |
|---|---|---|---|
| Customer Name:<br>Town of Stockton Springs | | Town:<br>Stockton Springs, ME | Contact:<br>Courtney O'Donnell, Town Manager |
| Phone Number:<br>(207) 567-3404 | | Email:<br>manager@stocktonsprings.org | |
| Date of Install:<br>January, 2018 | System Size:<br>32 kW | Additional Notes:<br>Grid-tied system, utilizing a Power Purchase Agreement (PPA) | |

**Town of Waldoboro**

Sundog Solar installed a 111.7 kW solar array at the Waldoboro Landfill in 2017. The system contains 344 solar panels in 3 subarrays.

| | | | |
|---|---|---|---|
| Customer Name:<br>Town of Waldoboro | | Town:<br>Waldoboro, ME | Contact:<br>Julie Keizer, Town Manager |
| Phone Number:<br>(207) 832-5369 | | Email:<br>Jtownmgr@waldoboromaine.org | |
| Date of Install:<br>December 2017 | System Size:<br>111.7 kW | Additional Notes:<br>Grid-tied system, utilizing a Power Purchase Agreement (PPA) | |

**Pratt Chevrolet Buick GMC**

Sundog Solar has installed a 100kW system on the roof of Pratt Chevrolet Buick GMC in Calais. While on the project our electrical crew upgraded their electric service from 120/208V service to 277/480V service in order efficiently export all the power from the new array to the electric grid.


| Customer Name:<br>Pratt Chevrolet Buick GMC | | Town:<br>Calais, ME | Contact:<br>Ian Pratt |
|---|---|---|---|
| Phone Number:<br>(207) 454-0600 | | Email Address:<br>IanPratt@PrattChevrolet.com | |
| Date of Install:<br>December, 2016 | System Size:<br>100.24 kW | Additional Notes:<br>Grid-tied system utilizing SolarEdge inverters and optimizers. | |

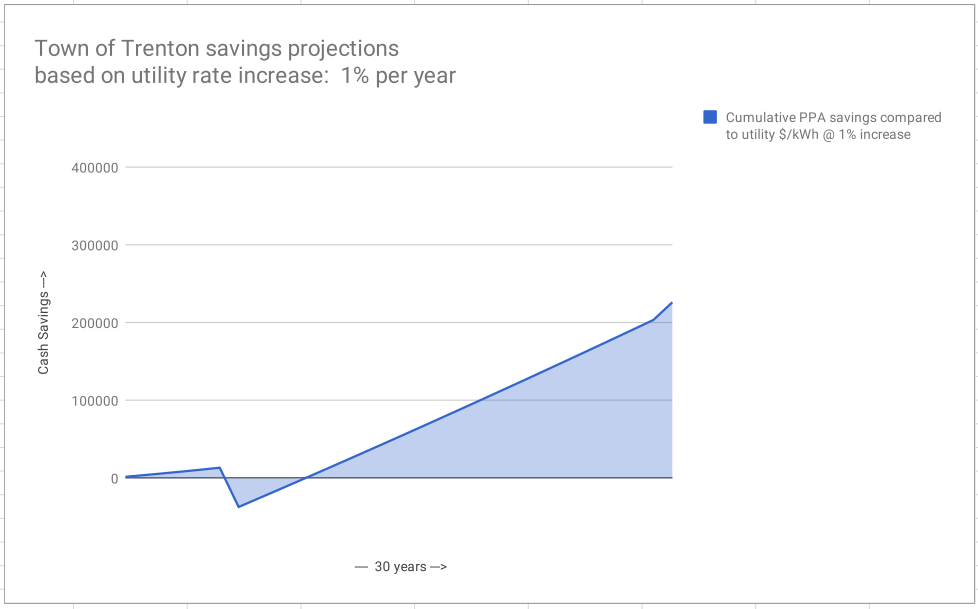
Additional references are available upon request

# Summary for Town of Readfield PPA

-> First 6 years PPA rate = $0.108 / kWh

-> Based on a projected 1% per year average utility cost increase, expected 30 year savings are $226,573

-> 1% rate increase results in 5 year payback after purchase



## Projected 1% Utility Rate incerase per year

### Town of Readfield Projected PPA Cost & Savings Schedule Buy out YR. 7

First 6 Years Electricity Savings | Estimated 30 Year Savings

| Year | Annual Generation assumes linear . 5% decrease per year | Utility $/kWh assumes 1% increase per year | Utility price based on current $. 1357 / kWh | Cumulative Utility Cost (Without Solar) | PPA $/kWh includes 12.5% discount off of the utility retail rate | Sundog Solar PPA Energy Price | Annual PPA savings compared to utility $/kWh | Purchase at estimated Fair Market Value | Cumulative PPA savings compared to utility $/kWh @ 1% increase |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 74,256 | 0.1357 | $10,076.54 | $10,076.54 | 0.1080 | $8,019.65 | $2,056.89 | 0 | $2,056.89 |
| 2 | 73,885 | 0.1371 | $10,126.42 | $20,202.96 | 0.1080 | $7,979.55 | $2,146.87 | 0 | $4,203.76 |
| 3 | 73,513 | 0.1384 | $10,176.29 | $30,379.24 | 0.1080 | $7,939.45 | $2,236.84 | 0 | $6,440.59 |
| 4 | 73,142 | 0.1398 | $10,226.14 | $40,605.38 | 0.1080 | $7,899.35 | $2,326.79 | 0 | $8,767.38 |
| 5 | 72,771 | 0.1412 | $10,275.97 | $50,881.36 | 0.1080 | $7,859.26 | $2,416.72 | 0 | $11,184.10 |
| 6 | 72,400 | 0.1426 | $10,325.78 | $61,207.14 | 0.1080 | $7,819.16 | $2,506.62 | 0 | $13,690.72 |
| 7 | 72,028 | 0.1440 | $10,375.56 | $71,582.69 | 0.1260 | $9,078.61 | $10,375.56 | 60889 | -$36,822.72 |
| 8 | 71,657 | 0.1455 | $10,425.29 | $82,007.99 | 0.1273 | $9,122.13 | $10,425.29 | 0 | -$26,397.43 |
| 9 | 71,286 | 0.1469 | $10,474.99 | $92,482.98 | 0.1286 | $9,165.62 | $10,474.99 | 0 | -$15,922.44 |
| 10 | 70,914 | 0.1484 | $10,524.64 | $103,007.62 | 0.1299 | $9,209.06 | $10,524.64 | 0 | -$5,397.80 |
| 11 | 70,543 | 0.1499 | $10,574.23 | $113,581.85 | 0.1312 | $9,252.45 | $10,574.23 | 0 | $5,176.43 |
| 12 | 70,172 | 0.1514 | $10,623.76 | $124,205.61 | 0.1325 | $9,295.79 | $10,623.76 | 0 | $15,800.19 |
| 13 | 69,801 | 0.1529 | $10,673.23 | $134,878.83 | 0.1338 | $9,339.07 | $10,673.23 | 0 | $26,473.42 |
| 14 | 69,429 | 0.1544 | $10,722.62 | $145,601.45 | 0.1351 | $9,382.29 | $10,722.62 | 0 | $37,196.04 |
| 15 | 69,058 | 0.1560 | $10,771.93 | $156,373.38 | 0.1365 | $9,425.44 | $10,771.93 | 0 | $47,967.97 |
| 16 | 68,687 | 0.1575 | $10,821.16 | $167,194.54 | 0.1379 | $9,468.51 | $10,821.16 | 0 | $58,789.13 |
| 17 | 68,316 | 0.1591 | $10,870.29 | $178,064.83 | 0.1392 | $9,511.51 | $10,870.29 | 0 | $69,659.42 |
| 18 | 67,944 | 0.1607 | $10,919.33 | $188,984.16 | 0.1406 | $9,554.41 | $10,919.33 | 0 | $80,578.75 |
| 19 | 67,573 | 0.1623 | $10,968.25 | $199,952.42 | 0.1420 | $9,597.22 | $10,968.25 | 0 | $91,547.00 |
| 20 | 67,202 | 0.1639 | $11,017.07 | $210,969.48 | 0.1434 | $9,639.94 | $11,017.07 | 0 | $102,564.07 |
| 21 | 66,830 | 0.1656 | $11,065.76 | $222,035.25 | 0.1449 | $9,682.54 | $11,065.76 | 0 | $113,629.83 |
| 22 | 66,459 | 0.1672 | $11,114.33 | $233,149.58 | 0.1463 | $9,725.04 | $11,114.33 | 0 | $124,744.16 |
| 23 | 66,088 | 0.1689 | $11,162.76 | $244,312.34 | 0.1478 | $9,767.42 | $11,162.76 | 0 | $135,906.92 |
| 24 | 65,717 | 0.1706 | $11,211.05 | $255,523.39 | 0.1493 | $9,809.67 | $11,211.05 | 0 | $147,117.97 |
| 25 | 65,345 | 0.1723 | $11,259.19 | $266,782.58 | 0.1508 | $9,851.79 | $11,259.19 | 0 | $158,377.16 |
| 26 | 64,974 | 0.1740 | $11,307.17 | $278,089.74 | 0.1523 | $9,893.77 | $11,307.17 | 0 | $169,684.33 |
| 27 | 64,603 | 0.1758 | $11,354.98 | $289,444.72 | 0.1538 | $9,935.61 | $11,354.98 | 0 | $181,039.31 |
| 28 | 64,231 | 0.1775 | $11,402.62 | $300,847.34 | 0.1553 | $9,977.29 | $11,402.62 | 0 | $192,441.93 |
| 29 | 63,860 | 0.1793 | $11,450.07 | $312,297.42 | 0.1569 | $10,018.82 | $11,450.07 | 0 | $203,892.00 |
| 30 | 63,489 | 0.1811 | $11,497.34 | $323,794.75 | 0.1585 | $10,060.17 | $11,497.34 | 0 | $226,573.44 |


# 5BB Mono Crystalline Silicon Solar PV Modules - 1500V series

**ASM-7-PERC-AAA (AAA=330-340) | 72 Cells | 330-340 Wp**

## Highlights

- Superior temperature co-efficient and performance at NOCT, PTC ratings
- Excellent performance at low light irradiation (200W/m2)
- LIR treated cells with least LID effect
- 5 Bus Bar cells offering better reliability against microcracks
- Triple EL checking to ensure defect free modules
- PID, salt mist and Ammonia resistant

| Reduces installation costs by 1% | Reduces transport costs by 1% | Reduces land costs by 1% | Reduces BOS costs by 3% |
|---|---|---|---|

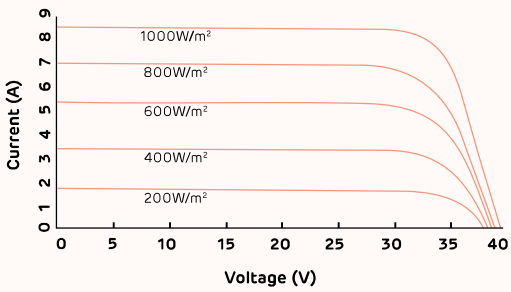
**Note:** The cost reduction data is based on the comparison with standard 72 cells (325 Wp) Polycrystalline modules for a scale of 1MW installation and may vary from site to site.

*As per Bloomberg New Energy Finance (BNEF) latest quarterly report, dated 20th February, 2018

www.adanisolar.com

# Technical Data

## Current-Voltage Curve

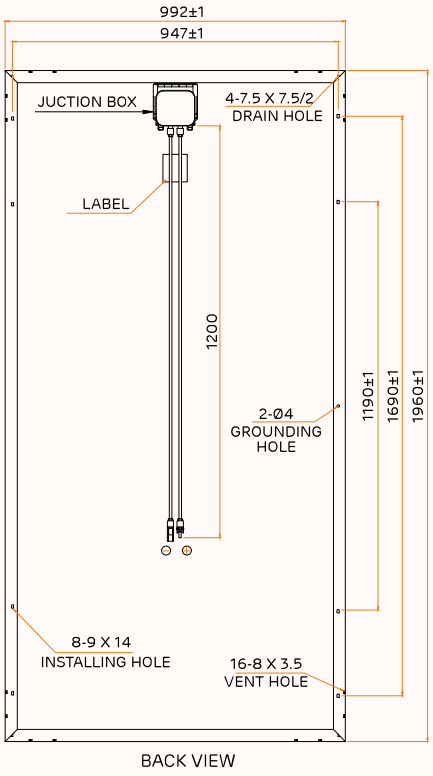



## Electrical data – All data measured to STC*

| | | | |
|---|---|---|---|
| Peak power, (0 ~+ 4.99 Wp) Pmax-(Wp) | 330 | 335 | 340 |
| Maximum voltage, Vmpp (V) | 37.83 | 37.96 | 38.19 |
| Maximum current, Impp (A) | 8.73 | 8.83 | 8.91 |
| Open circuit voltage, Voc (V) | 46.64 | 46.70 | 46.88 |
| Short circuit current, Isc (A) | 9.21 | 9.28 | 9.48 |
| Module efficiency (%) | 16.97 | 17.23 | 17.49 |

***STC:** Irradiance 1000 W/m², cell temperature 25°C, air mass AM1.5 according to EN 60904-3. Average efficiency reduction of 4.5 % at 200 W/m² according to EN 60904-1. Except Pmpp, all other parameters have a tolerance of +/-3 %, measurement uncertainty <3 %

## Dimensions in mm




BACK VIEW

## Electrical parameters at NOCT

| | | | |
|---|---|---|---|
| Power(Wp) at NOCT | 240 | 245 | 249 |
| V@Pmax(V) at NOCT | 34.10 | 34.79 | 35.08 |
| I@Pmax (A) at NOCT | 7.02 | 7.04 | 7.09 |
| Voc (V) at NOCT | 42.60 | 42.98 | 43.19 |
| Isc (A) at NOCT | 7.50 | 7.64 | 7.71 |

*NOCT irradiance 800 W/m2, ambient temperature 20°C, wind speed 1 m/sec

## Temperature co-efficients (TC) and permissible operating conditions

| | |
|---|---|
| TC of open circuit voltage ( β ) | -0.29% /°C |
| TC of short circuit current ( α ) | 0.048 % /°C |
| TC of power ( γ ) | -0.39 % /°C |
| Maximum system voltage | 1500 V (IEC & UL) |
| NOCT | 45°C ± 2°C |
| Temperature range | -40°C to + 85°C |

## Mechanical data

| | |
|---|---|
| Length | 1960 mm |
| Width | 992 mm |
| Height | 35 mm / 40 mm |
| Weight | 22 Kg (35 mm) / 27 Kg (40mm) |
| Junction box | IP67 |
| Cable and connectors | 1200 mm length cable, MC4 & Amphenol compatible connectors |
| Application class | Class A (Safety class II) |
| Superstrate | High transmittance arc glass |
| Cells | 72 mono-crystalline solar cells ; 5 bus bars, 156.75 mm x 156.75 mm |
| Encapsulation | Low shrinkage PID resistant EVA |
| Substrate | Back sheet |
| Frame | Anodized aluminium frame with twin wall profile |
| Mechanical load test as per IEC & UL | 5400 Pa-front ; 2400 Pa-back |
| Maximum series fuse rating | 15 A |

## Warranty and certifications

**Product warranty****
25 years linear power warranty

**Performance guarantee****
Power degradation < - 3 % in first year < - 0.68 % / year in 2-25 years

**Approvals and certificates:** IEC 61215 Ed2, IEC 61730, IEC 61701, UL 1703, MCS, JET, CEC, CEC-Aus, IEC 62716, IEC 62759, IEC 62804, IEC 62782, IEC 60068-2-68, IEC 61853

Recyclable packaging

EU 2011/65/EU WEEE COMPLIANT

*Caution:
Please read safety and installation instructions before using the product.

Note:
- The specifications included in this datasheet are subject to change without notice.
- The electrical data given here is for reference purpose only.
- Please confirm your exact requirements with the sales representative while placing your order.

** Warranty:
Please read Adani solar warranty documents thoroughly.

INVERTERS

# SolarEdge Commercial Three Phase Inverters for the 208V Grid

## for North America

SE43.2K


### Specifically designed to work with power optimizers

- Easy two-person installation – each unit mounted separately, equipped with cables for simple connection between units
- Balance of System and labor reduction compared to using multiple smaller string inverters
- Independent operation of each unit enables higher uptime and easy serviceability
- No wasted ground area: wall/rail mounted, or horizontally mounted under the modules (10˚ inclination)
- Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- Built-in module-level monitoring with Ethernet or cellular GSM
- Fixed voltage inverter for superior efficiency (97%) and longer strings
- Integrated DC Safety Switch and optional surge protection & DC fuses (plus & minus)
- Built-in RS485 Surge Protection Device, to better withstand lightning events

# SolarEdge Commercial Three Phase Inverters for the 208V Grid for North America SE43.2K

| | SE43.2K | |
|---|---|---|
| **OUTPUT** | | |
| Rated AC Power Output | 43200 | VA |
| Maximum AC Power Output | 43200 | VA |
| AC Output Line Connections | 4-wire WYE (L1-L2-L3-N) plus PE or 3 wire Delta | |
| AC Output Voltage Minimum-Nominal-Maximum[1] (L-N) | 105-120-132.5 | Vac |
| AC Output Voltage Minimum-Nominal-Maximum[1] (L-L) | 183-208-229 | Vac |
| AC Frequency Min-Nom-Max[1] | 59.3 - 60 - 60.5 | Hz |
| Maximum Continuous Output Current (per Phase) @208V | 120 | A |
| GFDI Threshold | 1 | A |
| Utility Monitoring, Islanding Protection, Configurable Power Factor, Country Configurable Thresholds | Yes | |
| **INPUT** | | |
| Maximum DC Power (Module STC), Inverter / Unit | 58200 / 19400 | W |
| Transformer-less, Ungrounded | Yes | |
| Maximum Input Voltage DC to Gnd | 300 | Vdc |
| Maximum Input Voltage DC+ to DC- | 600 | Vdc |
| Nominal Input Voltage DC to Gnd | 200 | Vdc |
| Nominal Input Voltage DC+ to DC- | 400 | Vdc |
| Maximum Input Current | 114 | Adc |
| Maximum Input Short Circuit Current | 135 | Adc |
| Reverse-Polarity Protection | Yes | |
| Ground-Fault Isolation Detection | 350kΩ Sensitivity per Unit | |
| CEC Weighted Efficiency | 97 | % |
| Nighttime Power Consumption | < 12 | W |
| **ADDITIONAL FEATURES** | | |
| Supported Communication Interfaces | RS485, Ethernet, Cellular GSM (optional) | |
| Rapid Shutdown | NEC2014 and NEC2017 compliant/certified, upon AC Grid Disconnect | |
| RS485 Surge Protection | Built-in | |
| **DC SAFETY SWITCH** | | |
| DC Disconnect | 1000V / 3 x 40A | |
| DC Surge Protection | Optional, Type II, field replaceable | |
| DC Fuses on Plus & Minus | Optional, 30A | |
| **STANDARD COMPLIANCE[2]** | | |
| Safety | UL1741, UL1741 SA, UL1699B, UL1998, CSA 2.22 | |
| Grid Connection Standards | IEEE 1547, Rule 21, Rule 14 (HI) | |
| Emissions | FCC part15 class A | |
| **INSTALLATION SPECIFICATIONS** | | |
| Number of units | 3 | |
| AC Output Conduit Size / Max AWG / Max PE AWG | 2" / 4/0 / 4 | |
| DC Output Conduit Size / Terminal Block AWG Range / Number of Strings[3] | 2 x 1.25" / 6-14 / 9 strings | |
| Dimensions (H x W x D) | Primary Unit: 37 x 12.5 x 10.5 / 940 x 315 x 260; Secondary Unit: 21 x 12.5 x 10.5 / 540 x 315 x 260 | in / mm |
| Weight | Primary Unit: 105.8 / 48; Secondary Unit 99.2 / 45 | lb / kg |
| Operating Temperature Range | -40 to +140 / -40 to +60[4] | ˚F / ˚C |
| Cooling | Fan (user replaceable) | |
| Noise | < 60 | dBA |
| Protection Rating | NEMA 3R | |
| Bracket Mounted (Brackets Provided) | | |

[1] For other regional settings please contact SolarEdge support
[2] Pending
[3] Single input option per unit (up to 3AWG) available
[4] For power de-rating information refer to: https://www.solaredge.com/sites/default/files/se-temperature-derating-note-na.pdf

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