

**Project: Ground Mounted System**

|                       |          |
|-----------------------|----------|
| Project Cost:         | \$58,028 |
| Focus On Energy Cost  | \$ 6,256 |
| Net Cost to District  | \$51,772 |
| Annual KW Savings     | 12,523   |
| Annual Dollar Savings | \$ 1,378 |

|                       |  |
|-----------------------|--|
| <b>Business Name:</b> | Rockwell Automation  |
| Project Location:     | Stanley Boyd School District   |
| Technology:           | Solar Electric, Grid-tied PV System  |
| Project Contact:      | Jim Jones, School Superintendent<br>507 E. 1 <sup>st</sup> . Ave.<br>Stanley, WI 54768<br>715-644-5584, ext. 107 |
| Authorized Signature: |  |

|                         |   |
|-------------------------|---|
| <b>Contractor Name:</b> | H&H Energy Services, Inc.   |
| Address:                | 3201 Latham Dr.   |
| City, State, Zip:       | Madison, WI 53713   |
| Project Contact:        | Chris Collins, Title: Project Manager,<br>Phone: 608-268-5923 <a href="mailto:ccollins@hhsolar.org">ccollins@hhsolar.org</a><br>Fax: 608-273-9764 |

**Section 5.2 Key Project Metrics – Ground Mount**

| <b>Key Project Metrics</b>   |               |
|--|---------------|
| (a) Net change in electricity (kWh) from renewable technology            | 12,523 kWh/yr |
| (b) Net change in natural gas (Therms) from renewable technology         | N/A           |
| (c) \$/kWh proposed (up to \$0.50/kWh)                                   | \$.50         |
| (d) \$/Therm proposed (up to \$1.00/kWh)                                 | N/A           |
| (e) Total Incentive Amount Requested (\$)                                | \$6,256.50    |
| (f) Total Eligible Project Cost (\$)                                     | \$58,028      |
| (g) Project Completion Date  |               |
| (h) Average Monthly Peak Demand Offset (kW)                              | 5.16 kW       |
| (i) Expected Useful Life of renewable technology (years)                 | 40 yrs        |
| (j) New Construction (Yes or No)   | No            |
| (k) Annual Electricity Consumption in 2012 (kWh)                         |               |
| (l) Annual Gas Consumption in 2012 (Therms)                              |               |
| (m) Penalty Agreed to if applicant fails to meet Project Completion Date |               |

### **5.3.3 – Renewable Energy Analysis**

The details and specifications below were used to determine the solar electric annual kWh generation and kW demand offset for the proposed project. The **PvWatts V.1** is included below the specifications. A **PVSyst** analysis was also run for a more detailed comparison and included in the appendix of the application. PVSyst is an internationally respected and utilized software program for photovoltaic system designers that allows for more detailed modeling of system performance.

**Annual kWh generation:** 12,286 kWh/yr

**Annual kW demand offset:** 10.335 kW

#### **System Site Details**

Stanley Boyd School District  
507 E. 1<sup>st</sup>. Ave.  
Stanley, WI 54768

**Facility Type:** Educational Institution

**Percentage annual shading:** 0%, using Solar Pathfinder

**Percentage snow cover:** 1% at 35 degree tilt angle

#### **System Specifications**

| <b>Category</b> | <b>Description</b>   |
|-----------------|--|
| Solar Panels    | 39 – Suniva 265(watt) Mono panels  |
| Solar Inverter  | 1 – Fronius IG Plus 10.0 UNI   |
| Solar Racking   | Manually adjustable ground mount system – U.S. Solar Mount supported by galvanized pipe anchored in concrete |

**Number of panels and capacity :** (39) Suniva 265 watt modules = 10.335 kW-DC

**Number of Inverters & capacity :** (1) Fronius IG Plus 10.0 UNI

**Racking Type:** U.S. Solar Mount rack supported by 4” galvanized pipe in concrete

**Array Orientation:** Due South, 180 degrees

**Array Tilt Angle:** 35 degrees

### **PVWatts Outputs**

| Station Identification   |            |
|--------------------------|------------|
| City:                    | Eau_Claire |
| State:                   | Wisconsin  |
| Latitude:                | 44.87° N   |
| Longitude:               | 91.48° W   |
| Elevation:               | 273 m      |
| PV System Specifications |            |
| DC Rating:               | 10.3 kW    |
| DC to AC Derate Factor:  | 0.770      |
| AC Rating:               | 8.0 kW     |
| Array Type:              | Fixed Tilt |
| Array Tilt:              | 35.0°      |
| Array Azimuth:           | 180.0°     |
| Energy Specifications    |            |
| Cost of Electricity:     | 9.1 ¢/kWh  |

| Results |  |                    |                      |
|---------|--|--------------------|----------------------|
| Month   | Solar Radiation<br>(kWh/m <sup>2</sup> /day) | AC Energy<br>(kWh) | Energy Value<br>(\$) |
| 1       | 3.04   | 813                | 73.98                |
| 2       | 4.38   | 1039               | 94.55                |
| 3       | 5.11   | 1298               | 118.12               |
| 4       | 4.97   | 1161               | 105.65               |
| 5       | 5.71   | 1326               | 120.67               |
| 6       | 5.97   | 1295               | 117.85               |
| 7       | 5.99   | 1345               | 122.40               |
| 8       | 5.49   | 1217               | 110.75               |
| 9       | 4.69   | 1029               | 93.64                |
| 10      | 3.71   | 884                | 80.44                |
| 11      | 2.34   | 550                | 50.05                |
| 12      | 2.17   | 555                | 50.51                |
| Year    | 4.46   | 12513              | 1138.68              |

### **5.3.4 – Proposed Incentive Amount**

The proposed \$/kWh rate was calculated using the associated formula and values in Table 5.2:

$$\text{Line (a) X Line (c) + Line (b) X Line (d) = 12,5186 kWh / yr. X \$0.50 / kWh = \$6,256.50.}$$

### **5.3 – Project Cost**

The table below highlights the various components of the system and associated costs for the project. An attached quotation is also included in the appendices.

| <b>Line Item or Cost Category Description</b>                  | <b>Cost</b>     |
|--|-----------------|
| Solar modules – 39 - Suniva 265 watt panels                    | \$12,630        |
| Solar Inverter – Fronius IG Plus 10 kW                         | \$6,450         |
| Racking, concrete, steel poles                                 | \$10,840        |
| Labor: electrical, excavating, concrete work                   | \$17,850        |
| Balance of System – conduit, wire, supports, service gear, etc | \$10,258        |
| <b>Total Cost</b>  | <b>\$58,028</b> |