PSEG Long Island
SOLAR PIONEER & SOLAR ENTREPRENEUR PROGRAM
IMPLEMENTATION GUIDE FOR INSTALLATION CONTRACTORS
Rules & Procedures for Solar PV Systems
Production Estimating & Rebate Determination

Ver.19 – December 17, 2013

Program & Document Principles

DOCUMENT INTENT, OBJECTIVES & MANAGEMENT

PART I – Definitions, Overview & Objective
PART II - Rebate determination procedures & Post Inspection
Part III – Appeal Process
PART IV – Requirements for the Performance of Shading Analysis

The following document provides guidelines for the implementation of the Expected Performance Based Buy-down (EPBB) incentive structure for the PSEG Long Island’s solar photovoltaic customer rebate program.

Under the EPBB incentive structure, the customer rebate is a one-time upfront payment based on the expected system performance (using component efficiencies, orientation, tilt, and shading).

As such, special emphasis is placed on the accurate performance of shading analysis by sales people and installation contractors. The rules and procedures which follow are based on reinforcing the principles of fairness, accuracy and integrity across the industry.

This document has been developed in consultation with the local PV industry association, LISEIA. This guide is intended to be a living document and as such, modifications are anticipated on an as needed basis.

PART I – Definitions, Overview & Objectives

A. DEFINITIONS / GLOSSARY

1. General Program Definitions
   a) Applicant – The customer or customer agent responsible for submission of new rebate application packet to PSEGLI Rebate Processing and Power Asset Management. Applicants may include eligible PSEGLI Customers, Solar Contractors/Installers or “Integrators” such as leasing companies.
   b) Customer/Property Owner
i) **Commercial Customer** – Qualifying commercial electric customers located in the PSEGLI service territory under commercial rate codes 280, 281 and 285 are eligible to participate in the Solar Entrepreneur program.

ii) **Municipal, Schools and Not-for-profit Customers** – Qualifying municipal, schools and Not-for-profit electric customer located in the PSEGLI service territory under residential rate code 180 or commercial rate codes 280, 281 and 285 are eligible to participate in the Solar Entrepreneur program.

iii) **Residential Customer** – Qualifying residential electric customers located in the PSEGLI service territory under all residential rate codes are eligible to participate in the Solar Pioneer program.

c) **Net Metering** – A practice used in conjunction with a solar electric system where a customer electric meter tracks net power usage, spinning forward when the customer consumes electricity from the utility and spinning backward when the solar electric system is generating more electricity than needed.

d) **PV Contractor/Installer** – Contractors participating in PSEGLI’s customer solar rebate programs which have been screened by either RELI (Renewable Energy Long Island) or LISEIA (LI Solar Energy Industries Association).

e) **PV Rebate Application** – Required documents which must be signed by both the Customer and PV Contractor and includes but is not limited to the following – Customer information, system location and specifications, Terms and Conditions, rebate submission and processing instructions.

f) **System Site** – To be eligible for a PSEGLI Solar Program rebate, the customer must own the property where the PV system is located within the PSEGLI service territory.

2. **Production Assessment Definitions**

a. **Subarray, Flush Mount** – A grouping of modules arranged on a contiguous plane at the same pitch and orientation.

b. **Subarray, Tilt-Rack/Ballasted** – A grouping of "module assemblies" with similar shading characteristics; final determination of Subarray groupings shall be determined on a site specific assessment of overall array geometry and similar shading characteristics.

c. **Skyline** – A single fish-eye shaped image, sometimes also referred to as a "snapshot", from which trees and obstructions can be identified and translated into Solar Access data at that location. For example, multiple Skylines (snapshots) may be captured to accurately represent the conditions incident upon a single Subarray.

d. **Session** – A series of Skyline images compiled into one or several Reports, typically associated with a single Subarray.

e. **Report** – Among other information, a Report (typically exported in an html or PDF format) shows 12 monthly Solar Access (SA) values and a 12 month average SA value. The shading information within a Report is required for each Subarray when calculating system output.

f. **Solar Access (SA)** – The ratio between total actual incident solar energy in a year (accounting for shading) on a given area at a specific pitch and orientation divided by the maximum hypothetical amount of energy on that same area at the same pitch and orientation without any shading (expressed as a fraction or percentage). Note that SA values can be derived from either one or multiple Skyline images.

g. **Monthly SA** – SA fractions (for one or several Skylines) for a given month, 12 per year.

h. **Annual SA** – Average of each month's monthly SA values in the year.

i. **Total Solar Resource Fraction (TSRF)** – Fraction of actual (shaded) solar energy divided by un-shaded energy per year incident upon a given location at the OPTIMAL pitch and orientation (le. 34 deg pitch, 180 deg orientation).

j. **Expected Performance Based Buy-down (EPBB)** – A method by which rebate amounts are calculated based on the calculated "expected" kWh performance of a particular solar system. Key variables in the calculation include each array's pitch, orientation and shading information.

3. **Inspection & Appeal Definitions**

a. **Assessed Production (AP)** – The Year 1 annual kWh-AC* production which results after using the pitch, orientation, shading and equipment as observed by the Post Installation Inspection Contractor in the on-line PSEGLI Solar Electric Incentive Calculator.

b. **Claimed Production (CP)** – The Year 1 annual kWh-AC* production which results after using the pitch, orientation, shading and equipment specified by the contractor in the on-line PSEGLI Solar Electric Incentive Calculator (available on Web site Contractor Portal page).
c. **Commission Date** – The date which the system was commissioned by the Contractor and ready to be inspected by the Post Installation Inspection Contractor.

d. **Contractor/Installer** – A company, individual or other entity which installs solar modules, panels or support structures at the customer site location. Typically the Contractor/Installer is also the entity which submits the PSEGLI EPBB rebate application on behalf of the customer.

e. **Design Factor** – A value which represents the ratio of kWh-AC* determined for the actual system divided by the kWh-AC* of an optimally facing system with no shading.

f. **Deviations (D%)** – Fraction of Claimed Production (CP) more or less than Assessed Production (AP), whereby D% = CP/AP – 1 (positive result is over estimate, negative is underestimate).

g. **kWh-AC*** – The annual AC kWh production. The asterisk (*) denotes that this is the value as determined by the PSEGLI online calculator tool.

h. **kW-AC(CEC)** – For the purpose of the EPBB program, the AC system size is calculated using a standard rating established by the "California Energy Commission" (CEC). As such, the CEC AC system size is determined using the PTC module rating multiplied by the CEC specified inverter efficiency.

i. **Permission to Operate (PTO) Date** – The date which PSEGLI gives official permission for a solar system to operate and supply power to the grid.

j. **Post Installation Inspection Contractor** - This is the third party inspection agency, retained by PSEGLI to perform post installation site inspections.

B. **OVERVIEW AND OBJECTIVES**

1. **PSEGLI & Post Installation Inspection Contractor Role**
   a. PSEGLI is, and shall continue to be, closely involved in all aspects of the Post Installation Inspection design and implementation process.
   b. The results of the Post Installation Inspection Services shall be presented to the Authority in monthly Post Installation Inspection Reports. Monthly reporting shall include listings of inspections performed and findings.

2. **Inspection Agency Primary objectives**
   a. Visit customer sites to perform Post Installation Inspection Services to verify application accuracy of contractor submissions regarding system size, tilt, orientation, shading and Assessed Production.
   b. Attend monthly PSEGLI meetings and report findings to contractor/installer during appeal process.
   c. Report and track any discrepancies between the customer application, including Claimed Production (CP), and the as-found actual system installation and the resultant Assessed Production (AP), concerns about quality of work, and assist with appeal resolution.

3. **Typical Post Installation Inspection Process**
   a. Verify actual roof pitch & orientation, compare to that stated in application.
   b. Perform independent shading analysis at a given site, compare to that stated in application. See PART IV which outlines the exact rules which will be followed by the post installation inspector when performing the shading analysis.
   c. Verify equipment installed (inverters & modules) and compare to that stated in application.
   d. Use this data to calculate expected Year 1 in kWh-AC* Assessed Production, compared to Claimed Production. Both Contractor/Installer and the Inspection Agency shall use the PSEGLI Solar Electric Incentive Calculator Tool to calculate the systems expected performance.
   e. Submit report to PSEGLI. Submit information to Contractor in the event of discrepancies.

4. **Communications**
   a. All communications between the Post Installation Inspection Contractor and the Applicant / PV Contractor shall be via email designated by the contractor when establishing their rebate account.
   b. For email applicants, correspondences shall be the email designated in the respective application.
   c. All Post Installation Inspection findings and determinations shall remain confidential between the Applicant, PV contractor, Post Installation Inspector and PSEGLI and shall not be released to the general public.
PART II – Rebate Determination Procedures & Post Inspection

A. PROCEDURE SUMMARY

1. Initial Site Analysis / Shading Assessment
   a. Performed by a salesperson and/or PV Contractor/Installer.
   b. All PV Contractors/Installers should be aware that the final rebate amount will be based on the inspection results from the PSEG LI Post Installation Inspection Contractor and system installation factors including size, tilt, orientation, shading and Assessed Production (AP).
   c. As such it is in the best interest for all parties to follow PART IV rules & processes explicitly.

2. Estimate of Rebate, Proposal Generation
   a. 12 month Solar Access (SA) values have been determined for each Sub-array according to PART IV instructions.
   b. Contractor shall input the results into the PSEG LI Solar Electric Incentive Calculator Tool and/or the Siebel online application interface to determine the rebate estimate and the expected system performance.
   c. Contractor determines initial rebate estimate and generates proposal for customer.

3. Rebate Application Submission
   a. Contractor generates application either (a) through Siebel On-line Application Process or (b) email/paper process.
   b. As part of rebate paperwork preparation, contractor shall ensure that the PDF Sub-array Solar Access reports explicitly annotate the removal of shading obstructions or other adjustments.
   c. Note that failure to communicate such information may complicate a post installation inspection and result in an unnecessary inspection failure.
   d. Initial rebate application is signed by the client.

4. Rebate Preapproval
   a. Following technical review by Power Asset Management (PAM) and document review and acceptance by Rebate Processing, a pre-approval letter will be issued.
   b. In the event of any discrepancies, contractor will be notified.

5. Install, Commission System & Initial Closeout
   a. Contractor installs and commissions the PV system.
   b. Upon commissioning, the contractor/installer submits all solar PV closeout documents (either through the Siebel Online Application process or through the email process).
   c. Upon receipt and approval of the Electrical Certificate and Certificate of Compliance, a Meter & Test inspection will be initiated for all projects. If the system passes the net meter will be installed.
   d. The Post Installation Inspection Contractor will be notified and determines if the system is to be inspected.

6. Inspection Determination
   a. After submission of all closeout documents (which also indicates that the system is ready to be inspected), the Post Installation Inspection Contractor shall make a selection based on a percentage of contractor inspections or other criteria as determined by PSEG LI at their discretion.
   b. Post Installation Inspections will be initiated at the same time and in parallel with Meter & Test function test and net meter installation process.
   c. If the system is NOT to be inspected, the original submission stands and no notification or revised paperwork is necessary.
7. **System Inspection**
   a. The Post Installation Inspection Contractor will schedule the inspection directly with the Customer or their authorized representative. Authorized representative must be over the age of 18 and other than the Solar Contractor/Installer/Integrator.
   b. Inspections are to be scheduled at the customer or the authorized representative’s convenience during normal business hours, Monday thru Friday and allow a two hour appointment window to be confirmed in advance.
   c. If the applicant or the authorized representative is not present for the inspection, the Post Installation Inspector will not conduct the inspection unless written permission was previously obtained.
   d. All documents submitted in the application process will be utilized by the Post Installation Inspector as part of the inspection process; no additional documentation is required from the applicant to perform the inspection.

8. **Inspection Results & Next Step Determination**
   a. The Post Installation Inspection Contractor has ten (10) days to complete inspections from the day assigned to them.
   b. The Post Installation Inspection Contractor shall submit to PSEG LI the results of the inspection including 12 months of SA values for each sub array, the final Assessed Production (AP) value and the resultant rebate amount.
   c. In the event that the results are not within a 2% tolerance level, the contractor will be notified directly by the Post Installation Inspection Contractor as specified in Part I, Section B: Overview and Objectives, 4. Communications. *(Note: For approximately four (4) to six (6) weeks, there will be an additional “grace” variance of 5% until a base level of compliance has been established and approved by PSEG LI).*
   d. Based on the results of the independent inspection, Contractor shall determine the desired course of action which may include proceeding with the results of the post-inspection OR initiating an appeal process. For more information on the appeal process, see PART III.

9. **Rebate Application Re-submission (if applicable)**
   a. If the Customer assigns the rebate to the Contractor and if the rebate value will be different, Contractor shall use the Post Installation Inspection results. It will not be necessary to have the application revised and re-signed by the Customer.
   b. If the Customer is receiving the rebate directly (not assigned to the Contractor), then PSEG LI will require acknowledgment and acceptance of the revised rebate amount (email confirmations are permitted).
   c. If the Post Installation Inspector finds that the Contractor underestimated the system output and rebate, the original rebate amount remains the same as reflected in the Customer pre-approval letter.
   d. If there is a change in system equipment, a revised application is required along with the closeout documentation.

10. **Rebate Payment**
    a. The customer rebate will be paid after an inspection is completed and no appeals are pending. No portion of the rebate will be paid during the duration of an Appeal process.
    b. PSEG LI’s payment will be tied to on the amount in the final rebate application submitted with the closeout documentation, provided it is consistent with the results of the Post Installation Inspection.

B. **SELECTION OF INSPECTED SYSTEMS**
   1. It is PSEG LI’s intention that a representative sample of solar systems shall be inspected. The number of systems may change over time and shall be at the sole discretion of PSEG LI program management.
   2. At PSEG LI’s discretion, contractors’ performance records or other criteria may determine the number of systems to be inspected.
### C. SUMMARY OF POST INSTALLATION INSPECTION PROCEDURES

<table>
<thead>
<tr>
<th>SCENARIO TYPE</th>
<th>METRIC</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uninspected System</td>
<td>(not applicable)</td>
<td>Rebate corresponding to the “CP” amount on the current application stands. No revisions to the rebate application upon closeout are necessary.</td>
</tr>
<tr>
<td>Underestimate</td>
<td>CP is less than AP</td>
<td>If the Post Installation Inspector finds that the Contractor underestimated the system output and rebate, the original rebate amount remains the same as reflected in the Customer pre-approval letter. Contractor/Customer must keep the initial CP rebate amount and no revised rebate paperwork is necessary upon closeout.</td>
</tr>
<tr>
<td>Within Tolerance</td>
<td>AP is greater than or equal to CP or less than or equal to 1.02*AP</td>
<td>Post Installation Inspection estimates (the AP value) will be the basis for impacts in Siebel; however, the rebate corresponding to the CP amount remains the same. No revisions to the rebate application upon closeout are necessary.</td>
</tr>
<tr>
<td>Overestimate</td>
<td>CP is greater than 1.02*AP</td>
<td>Post Installation Inspection estimates will be the basis for impacts in Siebel and rebate calculations NOTE: If the rebate is not assigned to a third party then, based on the AP shading results, the new rebate value must be acknowledged. If the rebate is assigned, then a revised, signed application is not necessary. Contractor may also initiate an appeal process if desired.</td>
</tr>
</tbody>
</table>
PART III– Appeal Process

Prior to initiating the appeal process, the Customer and/or PV Contractor should review the common sources of discrepancy in developing estimates for system production. See PART IV below for additional details.

### COMMON SOURCES OF DISCREPANCY

- Foliage for trees (IE winter readings) not properly filled in
- Additional skylines incorporated in the analysis where the array is not located
- Skylines not evenly spaced within the array area or around the perimeter of the array
- Too few skylines taken resulting in greater error

1) **Inspection Results Sent / Assessment**
   a. Contractor shall review the results of the report for concurrence *(via method TBD).*
   b. Upon review, Contractor shall determine whether to request an appeal.
   c. As specified previously, if contractor decides not to appeal, contractor shall generate new application paperwork using the revised 12 month shading values for each sub array, as submitted by the Post Installation Inspection Contractor.
   d. If the Contractor decides to submit an Appeal, the following steps apply.

2) **Appeal Request Submission**
   a. Contractor submits formal request to appeal in writing *(in a method TBD).*
   b. As part of Appeal Request submission, contractor shall submit PDF scans of where the skylines were taken on the roof.

3) **Initial Phone / Web Consultation**
   a. Prior to meeting on site, if necessary, it is critical to ensure that both parties are fully aware of how each performed the site analysis.
   b. Contractor should web-conference using a computer with the Solmetric software installed, with salesperson / inspector present that performed the analysis, and have the Solmetric site visit raw files available. As such, a web-conference with the Post Installation Inspection Contractor is much more effective in identifying possible discrepancies between inspections.
   c. Similarly, the Post Installation Inspection Contractor shall display where skylines were taken and how the various readings were used to produce the inspection results.
   d. If differences are not reconciled between the Post Installation Inspector and the Contractor, if deemed necessary, an onsite meeting may be called to jointly perform an on-site analysis.

4) **On-Site Analysis**
   a. Contractor and Post Installation Inspector will coordinate to schedule on site analysis with Customer.
   b. Meeting on site by both parties to each producing a second report using their own equipment.
   c. PV Contractor/Installer and the Post Installation Inspector meet at the system installation location at a pre-determined time.

5) **Dual Performance Analyses & Final Resolution**
   a. Using same skylines, both parties independently produce Solmetric PDF reports for each Subarray.
   b. Contractor and Post Installation Inspector to perform Phone/Web consultation to review discrepancies, as applicable.
   c. PSEGLI will determine and approve the final rebate amount.
PART IV – Requirements for the Performance of Shading Analysis

A. BASIS & PRINCIPLES APPLIED IN DEVELOPING SHADING ANALYSIS PROCEDURES

The primary objective in establishing rules for the performance of shading analysis is that the results are both (a) accurate and (b) reproducible. To that end we have established specific guidelines by which the PV installation contractors shall take their readings.

One method for increasing accuracy and reproducibility is to increase the quantity of Snapshots (Skylines) per unit area of the array. The illustration below describes this fundamental concept illustrating that if an infinite number of readings evenly spaced within the array, the error converges on zero. In addition, it is crucially important that a series of universally applied rules also be applied, such as trees be filled in if taken into the winter (others described in the guidelines as follows).

![Graph - Error Between Independent Reports as a function of Quantity of Snapshots per Unit Area](image)

Note that this Implementation Guide outlines the procedures and rules to be followed by both the Contractor and Post Installation Inspection Contractor.

B. REQUIREMENTS FOR PERFORMANCE OF SHADING ANALYSIS

1. Endorsed tools
   a. The preferred tool to be used by the Contractor shall be the Solmetric SunEye. It is currently the most functional and regarded as the industry standard.
   b. Program and nomenclature based on Solmetric SunEye tool (most common).
   c. Contractor may use any tool which accurately outputs Solar Access (SA) values for each month and yearly average in a PDF report which can be printed and submitted in the application.
   d. Similar tools may include Solar Pathfinder in conjunction with its software analysis tool.

2. Reports & Recordkeeping
   a. An official shading Report showing monthly SA values shall be produced for each Sub-array.
   b. Contractor should save records associated with analysis readings, such as exact location of each Skyline reading, etc., to demonstrate compliance with requirements.

3. Quantity of Skyline / Snapshot readings
   a. Contractor may elect to take MORE readings than the MINIMUM suggested in this procedure.
   b. As described in the narrative above, taking more readings, AS LONG AS THEY ARE EVENLY SPACED AMONG THE GEOMETRY OF THE ARRAY, will only increase the accuracy of the shading analysis.
4. Calculating quantity of Skylines / Snapshots to be taken by Contractor and Post Installation Inspection Contractor
   a. For typical sloped roof installations (~15 kW-DC-STC or less):
      One (1) Skyline (aka Snapshot) should be taken for 100 sqft of contiguous module surface area, whereby any fraction is ROUNDED UP to the next whole number.
   b. For large commercial or flat roof systems (~15 kW-DC-STC or more):
      One (1) Skyline (aka Snapshot) shall be taken for every 600 sqft of total MODULE ASSEMBLY ROOF AREA, whereby any fraction is ROUNDED UP to the next whole number.

5. Evenly Spaced Snapshot locations
   a. Snapshots shall be EVENLY SPaced within the geometry of the array, each representing the same proportion of surrounding array area.
   b. In ABSOLUTELY NO cases is it allowed to AVOID obstructions thereby skewing the final weighted averages; Snapshots shall be taken EVENLY across the array to obtain a representative sampling.

6. Reading adjustments
   a. If the shading analysis is performed during the winter, trees must be filled in to represent summer conditions. Note that it is not possible or practical to adjust the report to account for an estimated hypothetical increase in production during winter months.
   b. If not automatically generated, all obstructions must be completely filled in (i.e. chimneys, dormers, etc.)
   c. Any trees (or other obstructions) which will be removed prior to installation may be removed from the shading analysis as long as the obstructions removal provisions (below) are followed.

7. New Construction
   a. Contractors may
      i) Elevate the shading tool to the height of the new roof as necessary to produce accurate results, or
      ii) Estimate the Monthly Solar Resources and perform a final shading analysis after the building is erected and before the system is installed.
   b. With new construction projects after the contractor performs the final shading analysis, the client will need to sign a new rebate application with the revised rebate amount which may be more or less than the original submission.
   c. Such projects shall be subject to third party inspection just like any other project. Should a deviation be identified it will be processed according to the rules outlined in this document.

8. Roof / Array Accessibility
   a. As part of the rebate application submission process, roof access is mandatory in order to perform an accurate shading analysis.
   b. In the event PV panels on the roof either hamper the ability to reach the center of the PV array and/or the perimeter when performing the post installation inspection shading analysis, a procedure will be developed by the Post Installation Inspector and PSEG LI.

9. Failure to remove shading obstruction(s)
   a. If there are obstructions, it is recommended that if the client takes responsibility for removal (trees, extra chimneys, satellite dishes, etc). This agreement should be written into the contract with the solar contractor, clearly describing which objects are to be removed.
   b. A client’s failure to remove obstructions specified in the customer contract will naturally result in a rebate value commensurate with shading values shown at the time of the system inspection.
   c. The rebate will be paid based on the results of the Post Installation Inspector’s analysis.
C. SAMPLE ARRAY GEOMETRIES & ASSOCIATED SKYLINES & SNAPSHOT LOCATIONS

**Example 1 – Sloped Roof**

<table>
<thead>
<tr>
<th>Subarray</th>
<th>Calculations</th>
<th>Aerial Image</th>
<th>&quot;Skyline&quot; Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 of 1</td>
<td>Module Qty = 31&lt;br&gt;Module Area = 17.6 sqft&lt;br&gt;Array Area = 544 sqft&lt;br&gt;Minimum Qty Skylines = 544 / 100 = 5.44&lt;br&gt;Round up → 6</td>
<td>![Aerial Image]</td>
<td>![Skyline Distribution]</td>
</tr>
</tbody>
</table>

**Example 2 – Sloped Roof**

<table>
<thead>
<tr>
<th>Subarray</th>
<th>Calculations</th>
<th>Aerial Image</th>
<th>&quot;Skyline&quot; Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 of 2</td>
<td>Module Qty = 29&lt;br&gt;Module Area = 16.5 sqft&lt;br&gt;Array Area = 479 sqft&lt;br&gt;Minimum Qty Skylines = 479 / 100 = 4.79&lt;br&gt;Round up → 5</td>
<td>![Aerial Image]</td>
<td>![Skyline Distribution]</td>
</tr>
<tr>
<td>2 of 2</td>
<td>Module Qty = 9&lt;br&gt;Module Area = 16.5 sqft&lt;br&gt;Array Area = 149 sqft&lt;br&gt;Minimum Qty Skylines = 149 / 100 = 1.49&lt;br&gt;Round up to → 2</td>
<td>![Aerial Image]</td>
<td>![Skyline Distribution]</td>
</tr>
</tbody>
</table>

**Example 3 – Sloped Roof**

<table>
<thead>
<tr>
<th>Subarray</th>
<th>Calculations</th>
<th>Aerial Image</th>
<th>&quot;Skyline&quot; Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 of 3</td>
<td>Module Qty = 10&lt;br&gt;Module Area = 16.5 sqft&lt;br&gt;Array Area = 165 sqft&lt;br&gt;Minimum Qty Skylines = 165 / 100 = 1.76&lt;br&gt;Round up → 2</td>
<td>![Aerial Image]</td>
<td>![Skyline Distribution]</td>
</tr>
<tr>
<td>2 of 3</td>
<td>Module Qty = 8&lt;br&gt;Module Area = 16.5 sqft&lt;br&gt;Array Area = 132 sqft&lt;br&gt;Minimum Qty Skylines = 132 / 100 = 1.32&lt;br&gt;Round up to → 2</td>
<td>![Aerial Image]</td>
<td>![Skyline Distribution]</td>
</tr>
<tr>
<td>3 of 3</td>
<td>Module Qty = 6&lt;br&gt;Module Area = 16.5 sqft&lt;br&gt;Array Area = 99.0 sqft&lt;br&gt;Minimum Qty Skylines = 99 / 100 = 0.99&lt;br&gt;Round up to → 1</td>
<td>![Aerial Image]</td>
<td>![Skyline Distribution]</td>
</tr>
</tbody>
</table>
### Example 4 – Commercial

<table>
<thead>
<tr>
<th>Subarray</th>
<th>Calculations</th>
<th>“Skyline” Distribution</th>
</tr>
</thead>
</table>
| 1 of 1   | Mod Assembly Qty = 126  
          Assembly Area = 26.5 sqft  
          Array Area = 3333 sqft  
          Minimum Qty Skylines =  
          3333 / 600 = 5.55  
          Round up → 6 | |
|          | (Note the HVAC unit obstruction and regardless the Skylines are still taken evenly around seeking an even representation.) | |

### Example 5 – Commercial

<table>
<thead>
<tr>
<th>Subarray</th>
<th>Calculations</th>
<th>“Skyline” Distribution</th>
</tr>
</thead>
</table>
| 1 of 2   | Mod Assembly Qty = 42  
          Assembly Area = 23.0 sqft  
          Array Area = 924 sqft  
          Minimum Qty Skylines =  
          924 / 600 = 1.54  
          Round up → 2 | |
| 2 of 2   | Mod Assembly Qty = 101  
          Assembly Area = 23.0 sqft  
          Array Area = 2221 sqft  
          Minimum Qty Skylines =  
          2221 / 600 = 3.70  
          Round up → 4 | |
|          | (These “Sub arrays” should be manually created to accommodate observed general variations in shading conditions) | |