



PVsyst V8.0.6

PVsyst - Simulation report

Grid-Connected System

Project: PLFIT-0001

Variant: New simulation variant

No 3D scene defined, no shadings

System power: 323 kWp

PLFIT-0001 - Mexico



Project: PLFIT-0001

Variant: New simulation variant

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VCO, Simulation date:
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| Project summary | | | |
|---------------------------------------|---------------------|------------------|--|
| Geographical Site | Situation | Project settings | |
| PLFIT-0001 | Latitude 19.52 °N | Albedo 0.20 | |
| Mexico | Longitude -99.04 °W | | |
| | Altitude 2241 m | | |
| | Time zone UTC-6 | | |
| Weather data | | | |
| PLFIT-0001 | | | |
| Meteonorm 8.2 (2000-2009) - Synthetic | | | |

| System summary | | | |
|---------------------------|----------------------------------|---------------------|-----------|
| Grid-Connected System | No 3D scene defined, no shadings | User's needs | |
| Simulation for year no 10 | | Fixed constant load | |
| Orientation #1 | Near Shadings | 610 W | |
| Fixed plane | no Shadings | Global | |
| Tilt/Azimuth | 21 / 90 ° | 5344 kWh/Year | |
| | | No grid reinjection | |
| System information | | Inverters | |
| PV Array | | Nb. of units | 3.1 units |
| Nb. of modules | 465 units | Pnom total | 310 kWac |
| Pnom total | 323 kWp | Pnom ratio | 1.043 |

| Results summary | | | | |
|-----------------|-----------------|---------------------|----------------|---------------------------|
| Produced Energy | 2542.5 kWh/year | Specific production | 8 kWh/kWp/year | Perf. Ratio PR 0.45 % |
| Used Energy | 5343.6 kWh/year | | | Solar Fraction SF 47.58 % |

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Variant: New simulation variant

| General parameters | | | |
|-----------------------|------------------|---------------------|----------------------------------|
| Grid-Connected System | | | No 3D scene defined, no shadings |
| Orientation #1 | | | |
| Fixed plane | | Sheds configuration | Sizes |
| Tilt/Azimuth | 21 / 90 ° | Nb. of sheds | Sheds spacing |
| | | Set of tables | Collector width |
| | | Shading limit angle | Average GCR |
| | | Limit profile angle | ° |
| Models used | | Horizon | Near Shadings |
| Transposition | Perez | Free Horizon | no Shadings |
| Diffuse | Perez, Meteonorm | | |
| Circumsolar | separate | | |
| User's needs | | | |
| Fixed constant load | | | |
| 610 W | | | |
| Global | | | |
| 5344 kWh/Year | | | |
| No grid reinjection | | | |

| PV Array Characteristics | | | |
|----------------------------|--------------------------|---|--------------------------|
| PV module | | Inverter | |
| Manufacturer | Generic | Manufacturer | Generic |
| Model | CS7N-695TB-AG 1500V | Model | SUN2000-100KTL-M1-400Vac |
| (Original PVsyst database) | | (Original PVsyst database) | |
| Unit Nom. Power | 695 Wp | Unit Nom. Power | 100 kWac |
| Number of PV modules | 465 units | Number of inverters | 31 * MPPT 10% 3.1 units |
| Nominal (STC) | 323 kWp | Total power | 310 kWac |
| Modules | 31 string x 15 In series | Operating voltage | 200-1000 V |
| At operating cond. (50°C) | | Max. power ($\Rightarrow 33^{\circ}\text{C}$) | 110 kWac |
| Pmpp | 300 kWp | Pnom ratio (DC:AC) | 1.04 |
| U mpp | 549 V | No power sharing between MPPTs | |
| I mpp | 546 A | | |
| Total PV power | | Total inverter power | |
| Nominal (STC) | 323 kWp | Total power | 310 kWac |
| Total | 465 modules | Nb. of inverters | 4 units |
| Module area | 1444 m² | Pnom ratio | 0.9 unused |
| | | | 1.04 |

| Array losses | | | |
|----------------------|--|-----------------------------|--------------|
| Array Soiling Losses | Thermal Loss factor | DC wiring losses | |
| Loss Fraction | Module temperature according to irradiance | Global array res. | |
| 2.0 % | Uc (const) | 20.0 W/m²K | 16 mΩ |
| | Uv (wind) | 0.0 W/m²K/m/s | 1.5 % at STC |
| Module Quality Loss | Module mismatch losses | Module average degradation | |
| Loss Fraction | Loss Fraction | Year no | 10 |
| -0.4 % | 2.0 % at MPP | Loss factor | 0.4 %/year |
| | | Imp / Vmp contributions | 80% / 20% |
| | | Mismatch due to degradation | |
| | | Imp RMS dispersion | 0.4 %/year |
| | | Vmp RMS dispersion | 0.4 %/year |



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Array losses

IAM loss factor

Incidence effect (IAM): Fresnel, AR coating, n(glass)=1.526, n(AR)=1.290

| 0° | 30° | 50° | 60° | 70° | 75° | 80° | 85° | 90° |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1.000 | 0.999 | 0.987 | 0.963 | 0.892 | 0.814 | 0.679 | 0.438 | 0.000 |

System losses

Unavailability of the system

Time fraction 2.0 %

7.3 days,

3 periods



Project: PLFIT-0001

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Main results

System Production

| | |
|-----------------|-----------------|
| Produced Energy | 2542.5 kWh/year |
| Used Energy | 5343.6 kWh/year |

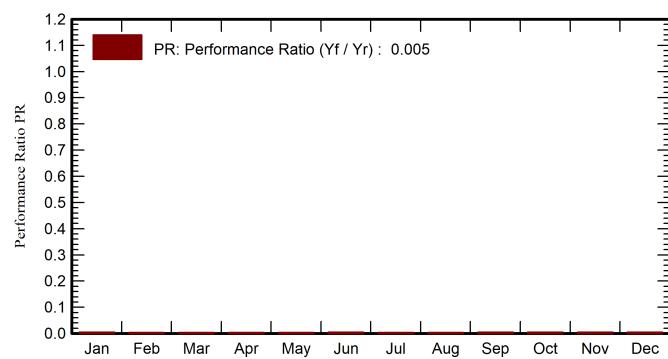
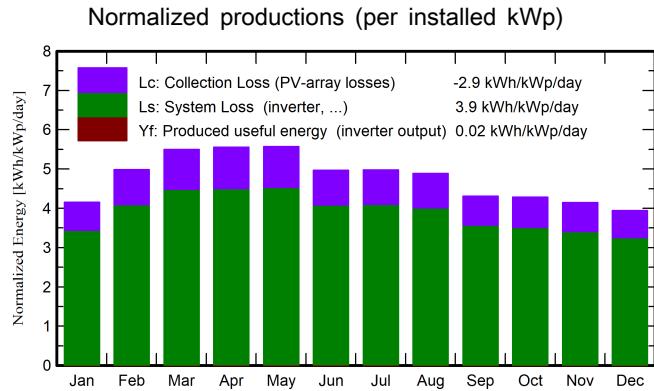
Specific production

| |
|----------------|
| 8 kWh/kWp/year |
| 0.45 % |

Perf. Ratio PR

| |
|---------|
| 0.45 % |
| 47.58 % |

Solar Fraction SF



Balances and main results

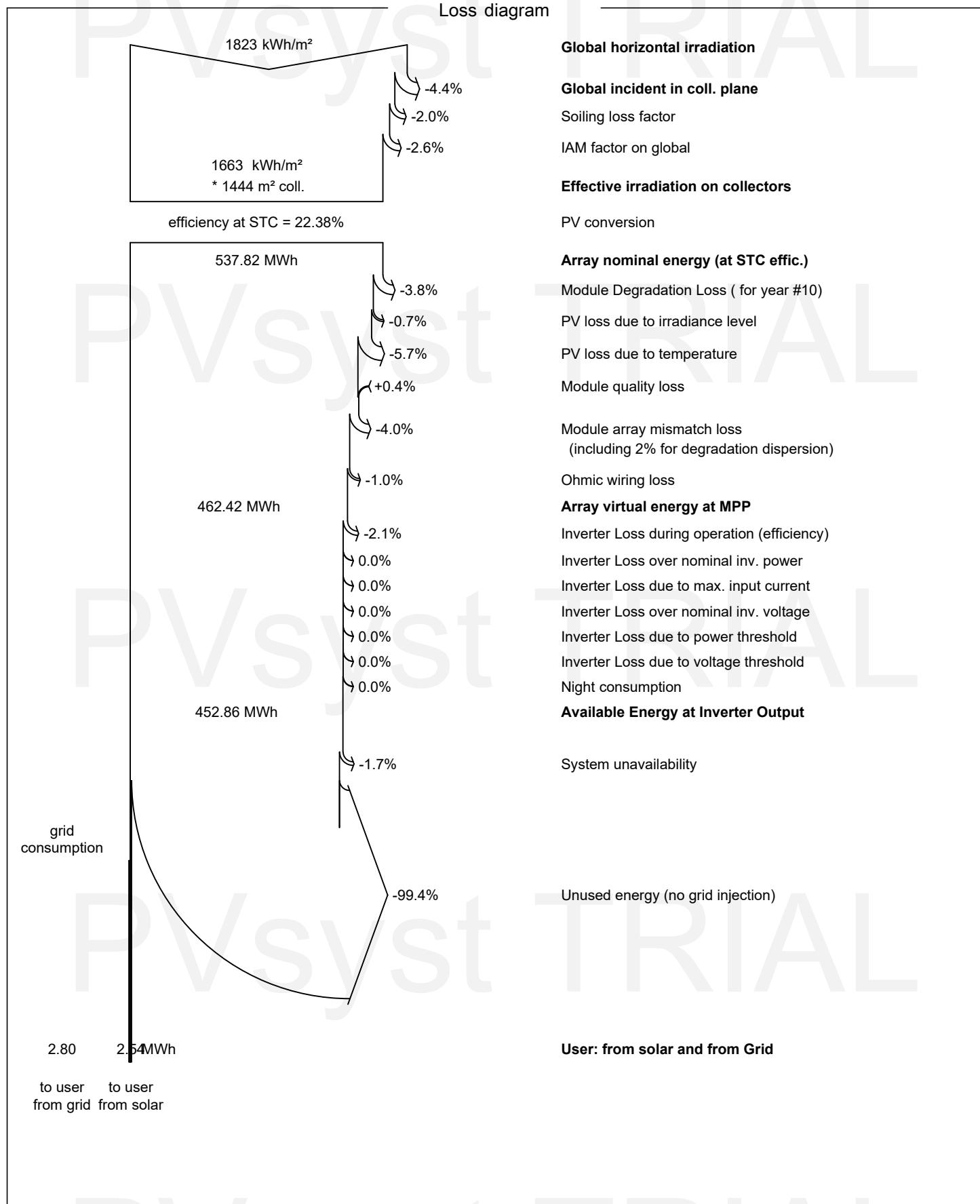
| | GlobHor kWh/m² | DiffHor kWh/m² | T_Amb °C | GlobInc kWh/m² | GlobEff kWh/m² | EArray MWh | E_User MWh | E_Solar MWh | EUnused MWh | EFrGrid MWh |
|-----------|-------------------|-------------------|-------------|-------------------|-------------------|---------------|---------------|----------------|----------------|----------------|
| January | 132.9 | 51.59 | 13.89 | 128.9 | 122.3 | 34.50 | 0.454 | 0.204 | 33.60 | 0.249 |
| February | 143.1 | 45.64 | 15.96 | 139.6 | 133.5 | 37.07 | 0.410 | 0.187 | 36.11 | 0.223 |
| March | 180.2 | 70.39 | 17.82 | 170.5 | 163.0 | 44.97 | 0.454 | 0.220 | 43.82 | 0.234 |
| April | 179.6 | 71.12 | 19.24 | 166.7 | 159.6 | 43.71 | 0.439 | 0.221 | 42.56 | 0.218 |
| May | 179.6 | 78.10 | 19.74 | 172.7 | 165.7 | 45.44 | 0.454 | 0.240 | 44.24 | 0.213 |
| June | 157.4 | 79.52 | 18.49 | 149.0 | 142.5 | 39.69 | 0.439 | 0.235 | 38.63 | 0.204 |
| July | 161.4 | 76.51 | 17.96 | 154.4 | 147.7 | 41.12 | 0.454 | 0.227 | 39.19 | 0.227 |
| August | 156.8 | 71.02 | 18.03 | 151.4 | 145.1 | 40.24 | 0.454 | 0.212 | 36.05 | 0.242 |
| September | 134.2 | 76.03 | 17.52 | 129.4 | 123.6 | 34.64 | 0.439 | 0.207 | 33.74 | 0.232 |
| October | 139.5 | 63.43 | 16.88 | 132.7 | 126.4 | 35.28 | 0.454 | 0.208 | 34.35 | 0.246 |
| November | 133.2 | 52.38 | 15.14 | 124.4 | 118.0 | 33.13 | 0.439 | 0.196 | 32.26 | 0.243 |
| December | 125.0 | 44.75 | 14.45 | 122.2 | 116.1 | 32.64 | 0.454 | 0.185 | 28.26 | 0.269 |
| Year | 1822.8 | 780.47 | 17.10 | 1742.0 | 1663.5 | 462.42 | 5.344 | 2.542 | 442.79 | 2.801 |

Legends

| | | | |
|---------|--|---------|---|
| GlobHor | Global horizontal irradiation | EArray | Effective energy at the output of the array |
| DiffHor | Horizontal diffuse irradiation | E_User | Energy supplied to the user |
| T_Amb | Ambient Temperature | E_Solar | Energy from the sun |
| GlobInc | Global incident in coll. plane | EUnused | Unused energy (no grid injection) |
| GlobEff | Effective Global, corr. for IAM and shadings | EFrGrid | Energy from the grid |



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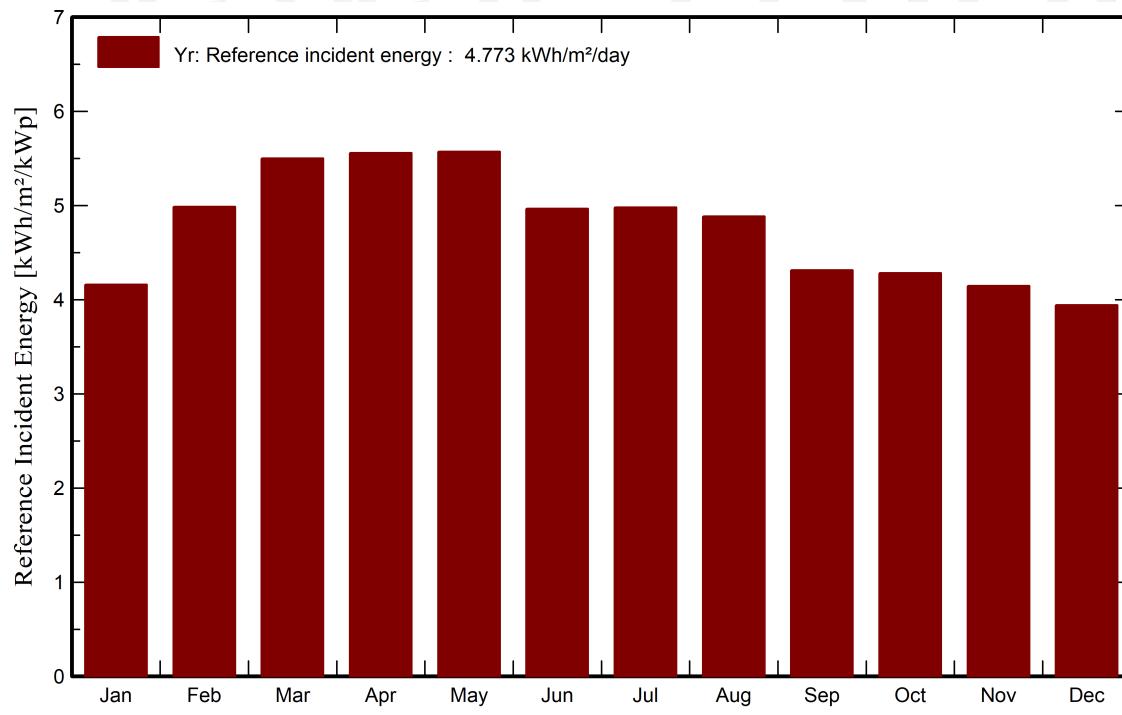


PVsyst V8.0.6

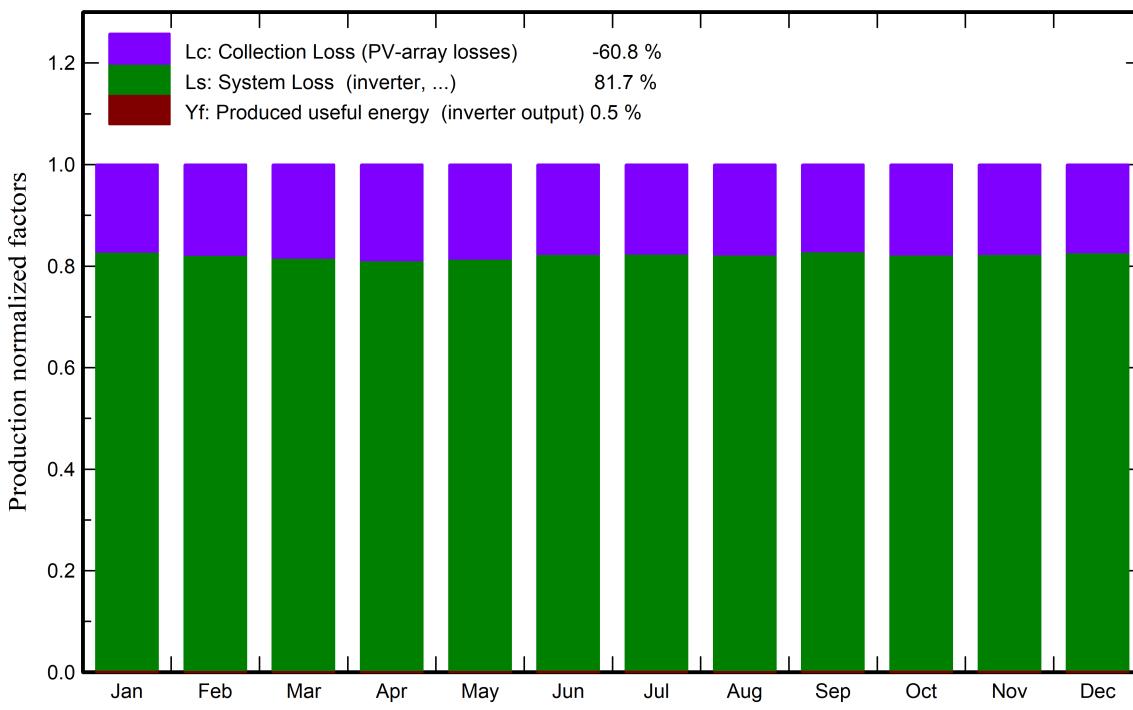
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Pref. graphs

Reference Incident Energy in Collector Plane



Normalized Production and Loss Factors



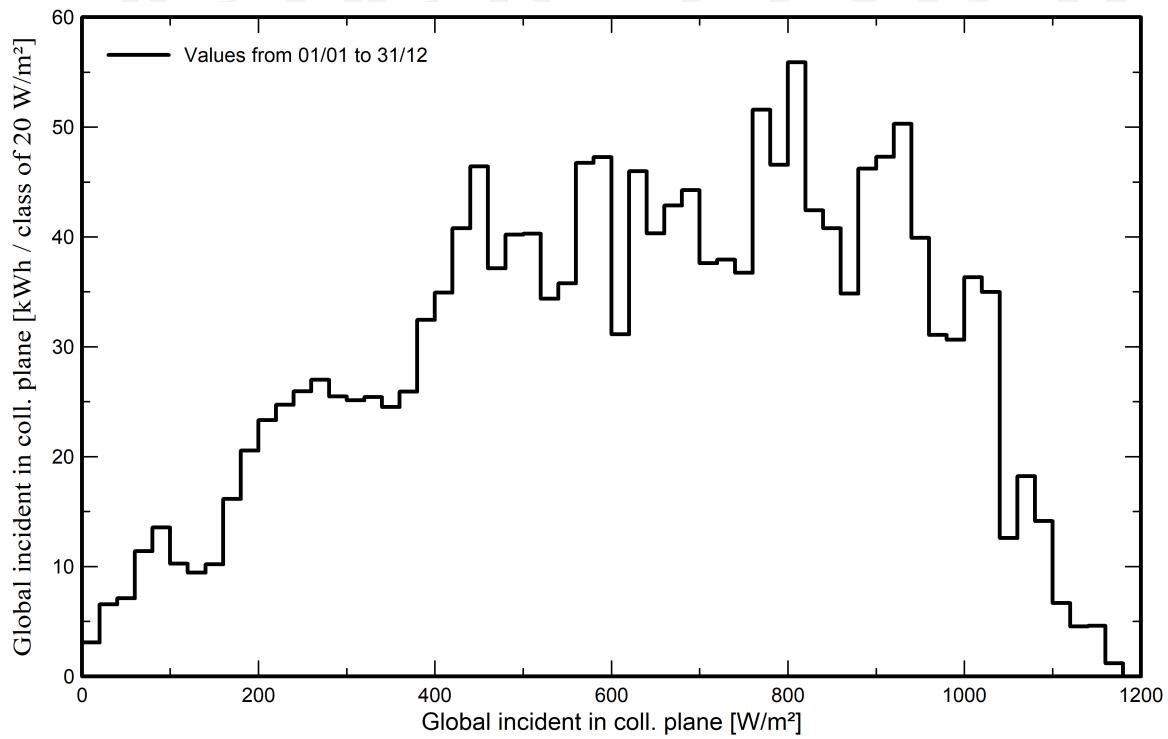


PVsyst V8.0.6

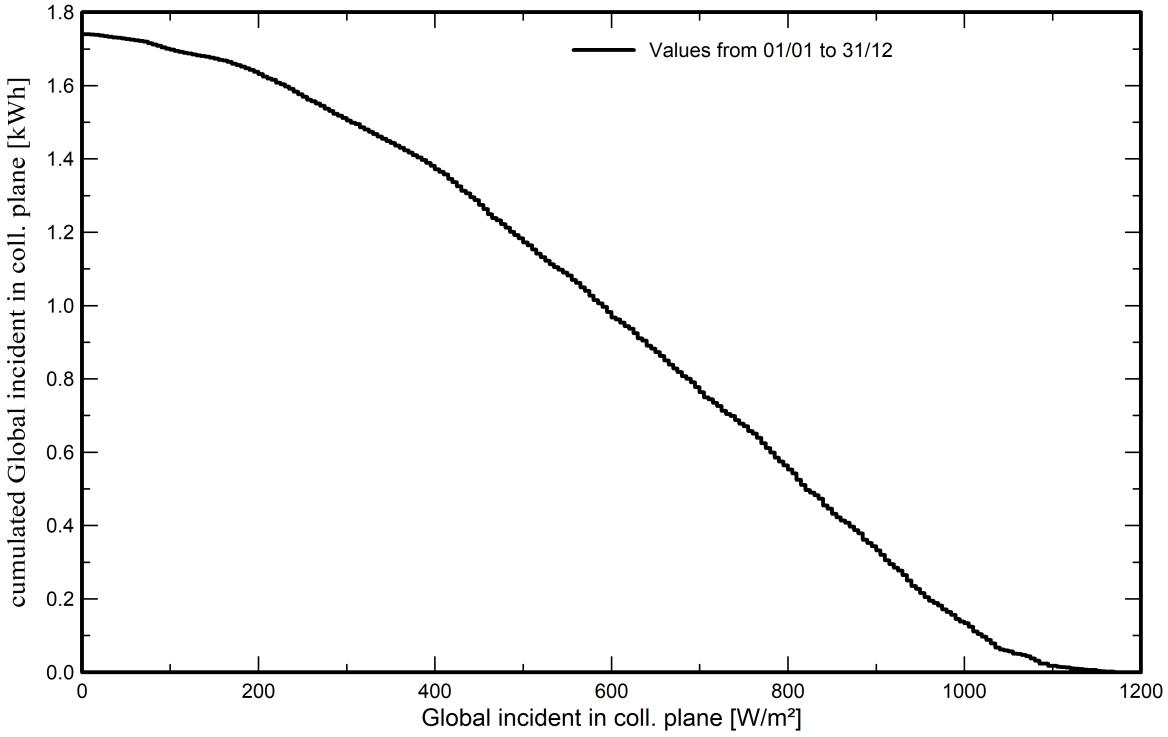
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Pref. graphs

Incident Irradiation Distribution



Incident Irradiation cumulative distribution



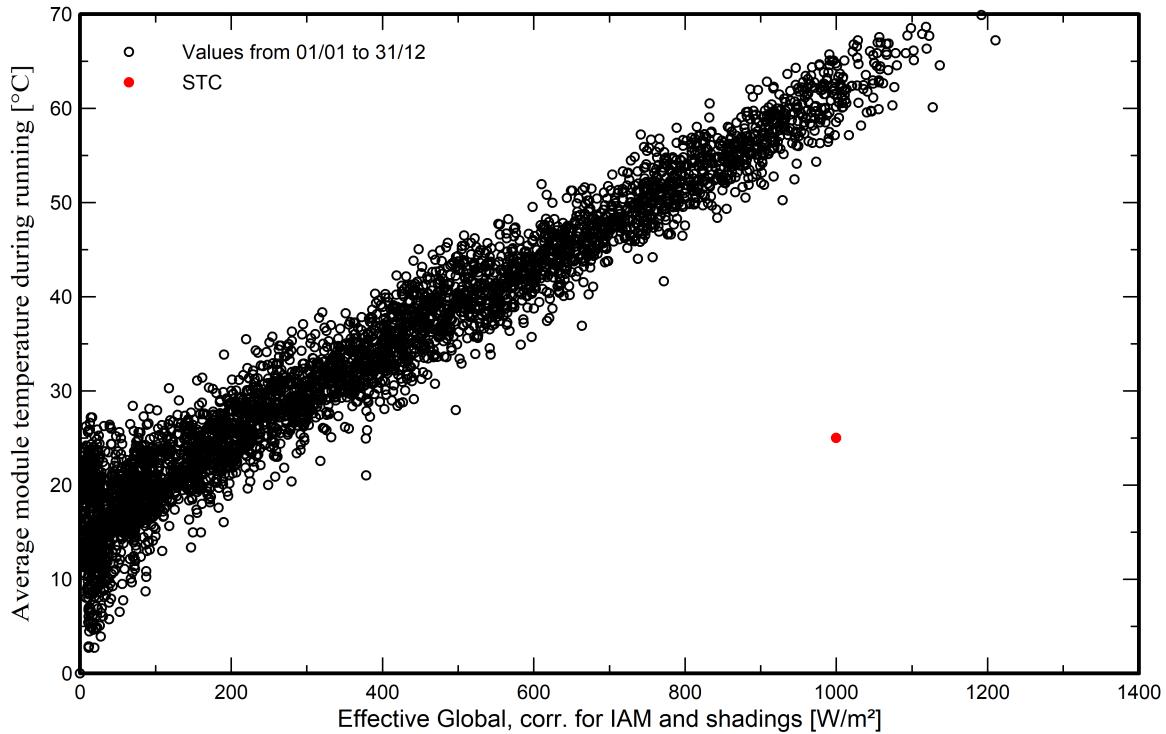


PVsyst V8.0.6

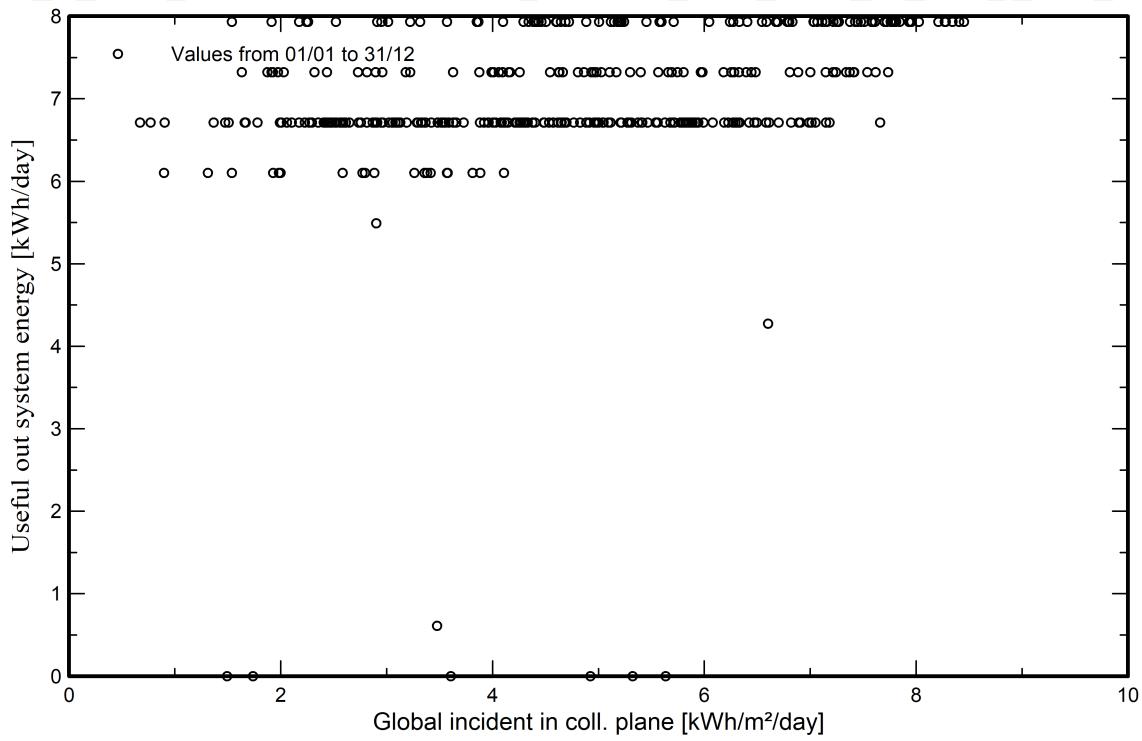
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Pref. graphs

Array Temperature vs. Effective Irradiance

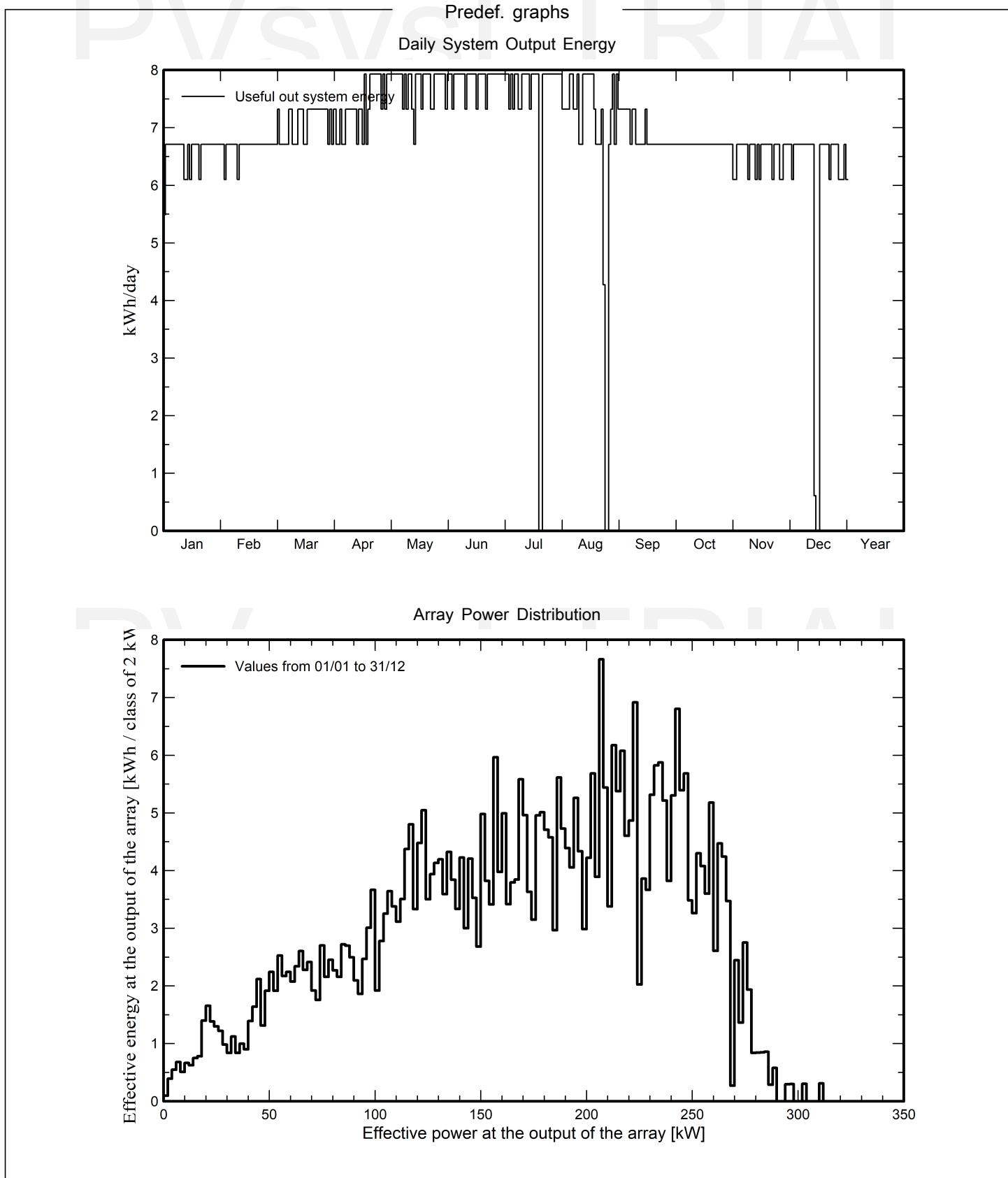


Daily Input/Output diagram



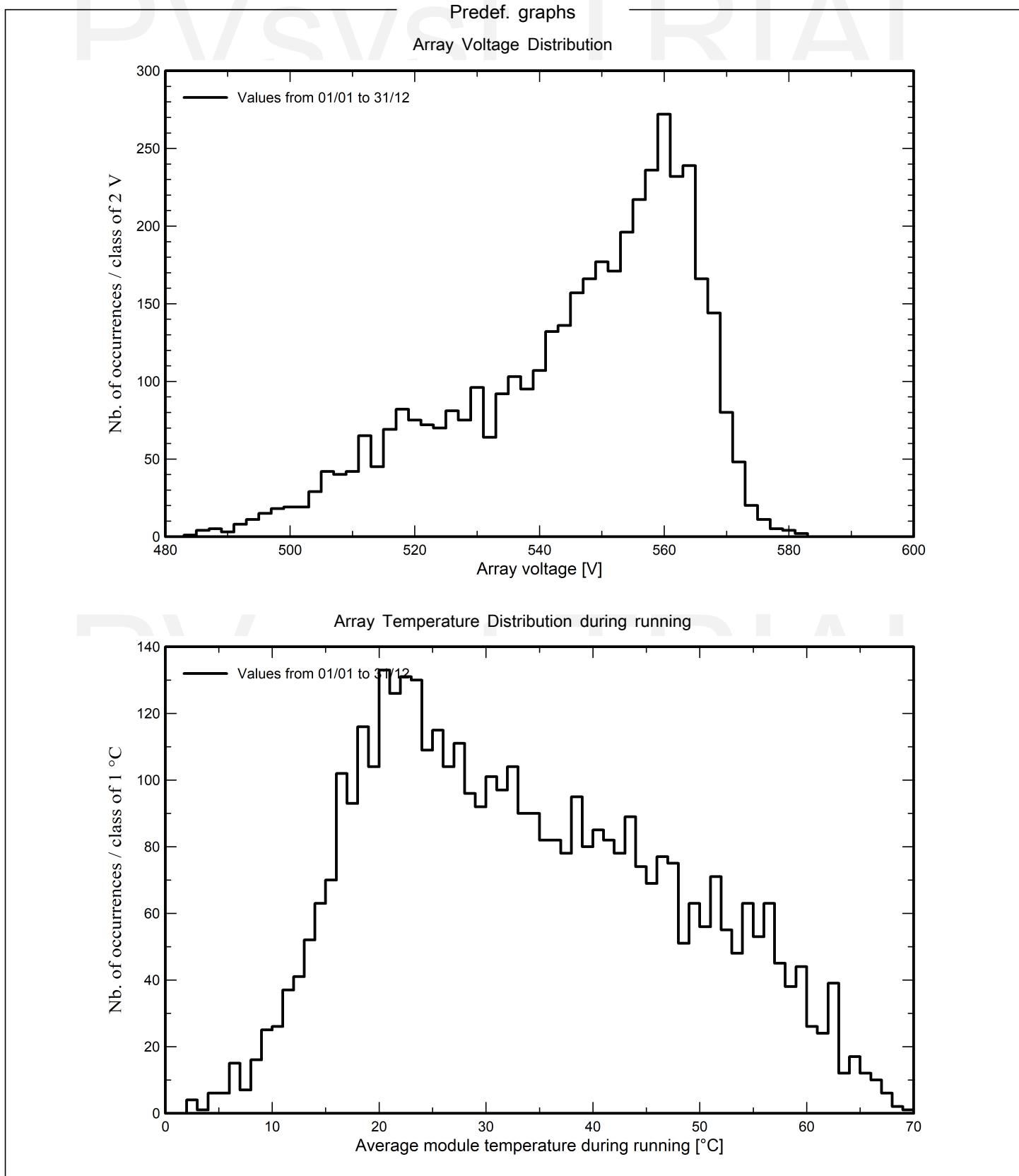


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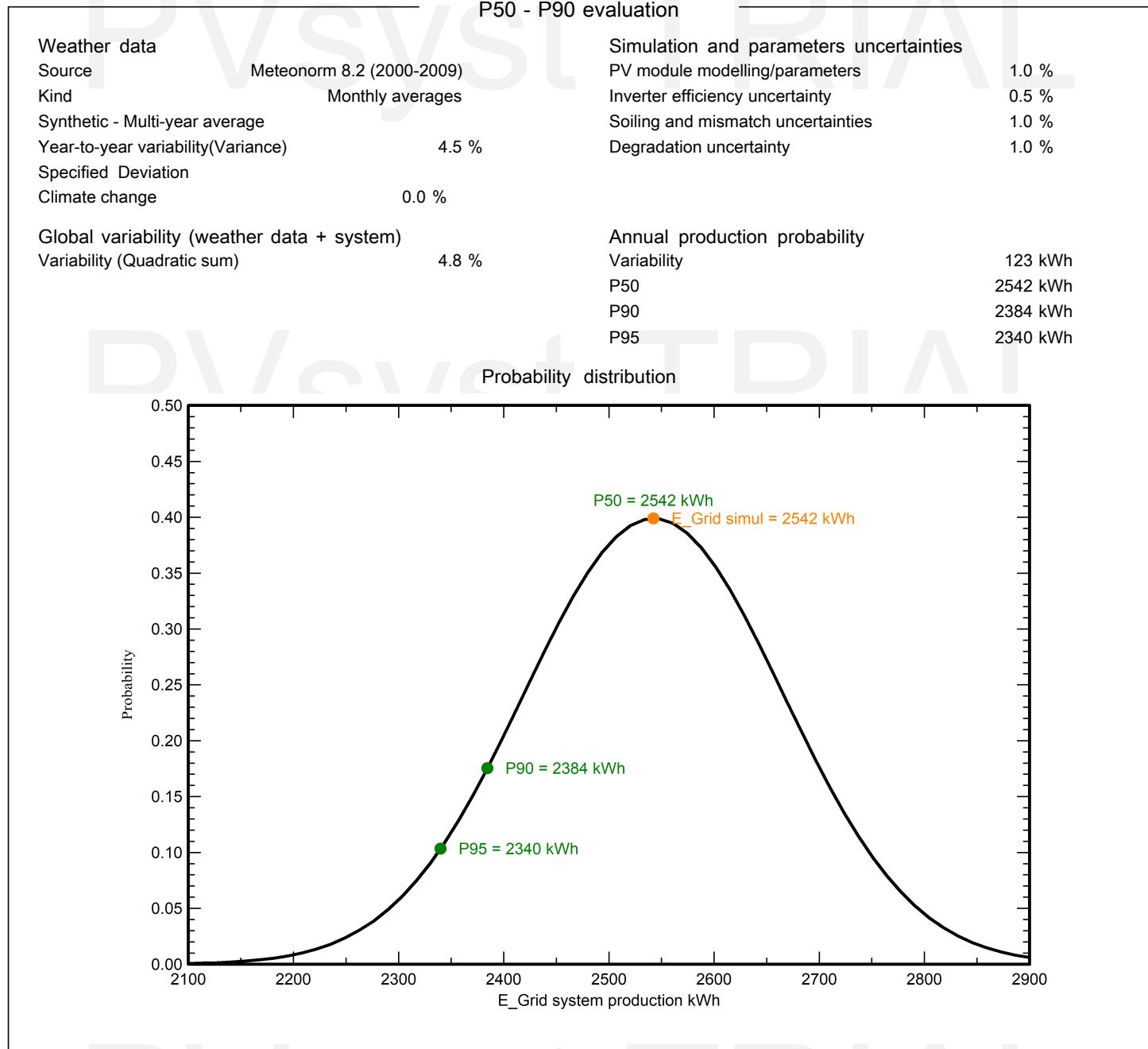


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PLFIT-0001-OnGrid

PLFIT-0001, Av. Carlos Hank González 50, Valle de Anahuac, 55248
Ecatepec de Morelos, Méx.

Shading Heatmap



Shading by Field Segment

| Description | Tilt | Azimuth | Modules | Nameplate | Shaded Irradiance | AC Energy | TOF ² | Solar Access | Avg TSRF ² |
|--------------------------------|--------------------------------|-----------------------------------|------------|------------------|----------------------------------|------------------------|------------------|--------------|-----------------------|
| Field Segment 1 | Module: 21.0° Surface: 5.0° | Module: 202.0° Surface: 112.0° | 158 | 109.8 kWp | 2,258.2 kWh/m ² | 210.2 MWh ¹ | 99.2% | 95.0% | 94.2% |
| Field Segment 2 | Module: 21.0° Surface: 5.0° | Module: 202.0° Surface: 22.0° | 94 | 65.3 kWp | 2,197.9 kWh/m ² | 122.0 MWh ¹ | 98.5% | 93.0% | 91.7% |
| Field Segment 4 | Module: 21.0° Surface: 5.0° | Module: 202.0° Surface: 292.0° | 81 | 56.3 kWp | 2,185.4 kWh/m ² | 104.3 MWh ¹ | 95.9% | 95.0% | 91.2% |
| Field Segment 3 | Module: 21.0° Surface: 5.0° | Module: 202.0° Surface: 202.0° | 132 | 91.7 kWp | 2,221.1 kWh/m ² | 172.4 MWh ¹ | 96.4% | 96.1% | 92.7% |
| Totals, weighted by kWp | | | 465 | 323.2 kWp | 2,222.8 kWh/m² | 608.9 MWh | 97.7% | 94.9% | 92.7% |

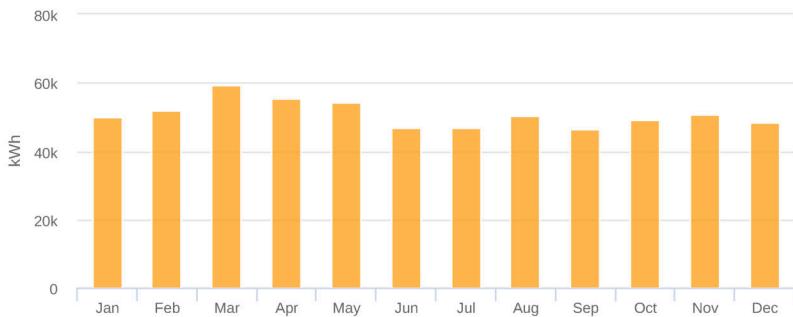
¹ approximate, varies based on inverter performance

² based on location Optimal POA Irradiance of 2,397.2 kWh/m² at 23.3° tilt and 175.0° azimuth

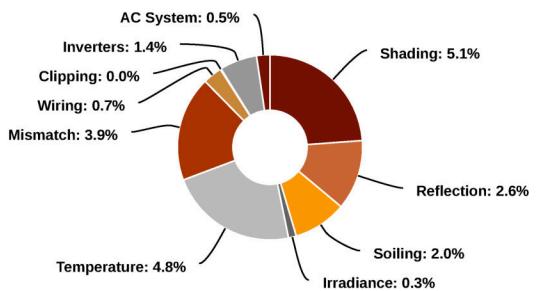
Solar Access by Month

| Description | jan | feb | mar | apr | may | jun | jul | aug | sep | oct | nov | dec |
|-------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Field Segment 1 | 90% | 94% | 97% | 97% | 97% | 97% | 97% | 97% | 97% | 95% | 94% | 88% |
| Field Segment 2 | 86% | 91% | 95% | 97% | 97% | 97% | 96% | 96% | 96% | 92% | 91% | 83% |
| Field Segment 4 | 90% | 94% | 97% | 98% | 98% | 98% | 97% | 97% | 97% | 95% | 94% | 86% |
| Field Segment 3 | 92% | 95% | 98% | 99% | 98% | 98% | 98% | 98% | 98% | 95% | 95% | 90% |
| Solar Access, weighted by kWp | 89.6% | 93.6% | 97.0% | 97.6% | 97.5% | 97.5% | 97.2% | 97.3% | 96.7% | 94.3% | 93.7% | 87.1% |
| AC Power (kWh) | 49,776.2 | 51,976.6 | 59,221.6 | 55,306.6 | 54,098.0 | 46,850.4 | 46,860.0 | 50,356.7 | 46,255.4 | 49,203.2 | 50,656.5 | 48,322.9 |

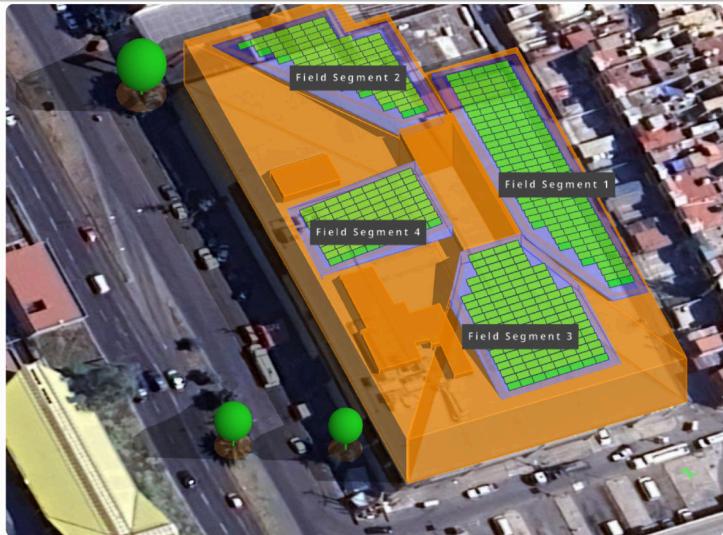
Monthly Production



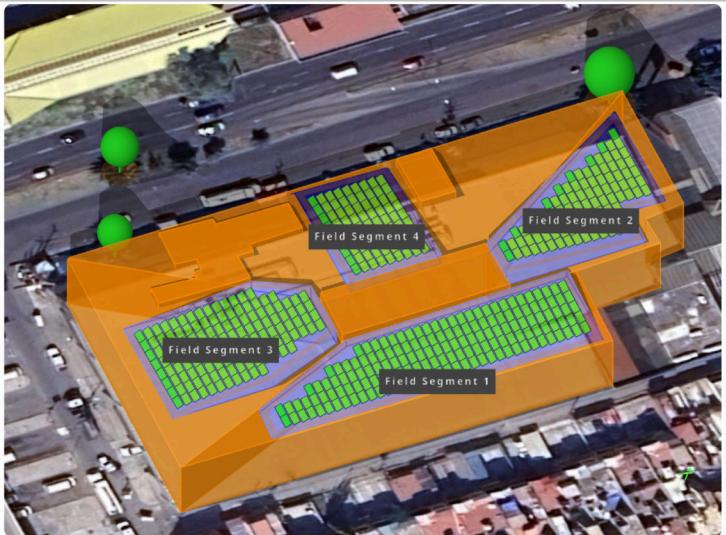
Sources of System Loss



Southwestern Angle



Southeastern Angle



PLFIT-0001-OnGrid

PLFIT-0001, Av. Carlos Hank González 50, Valle de Anahuac, 55248 Ecatepec de Morelos, Méx.

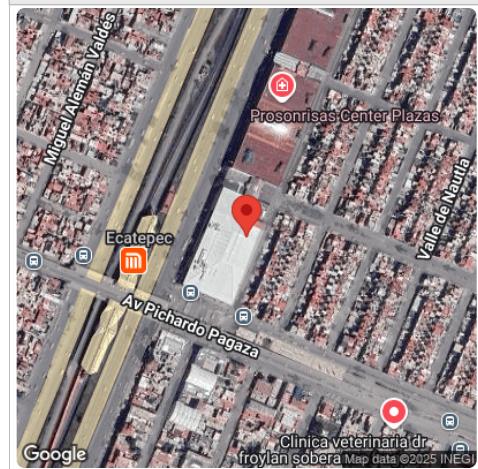
Report

| | |
|-----------------|--|
| Project Name | PLFIT-0001 |
| Project Address | Av. Carlos Hank González 50, Valle de Anahuac, 55248 Ecatepec de Morelos, Méx. |
| Prepared By | Marcial Becerril mbecerril92@gmail.com |

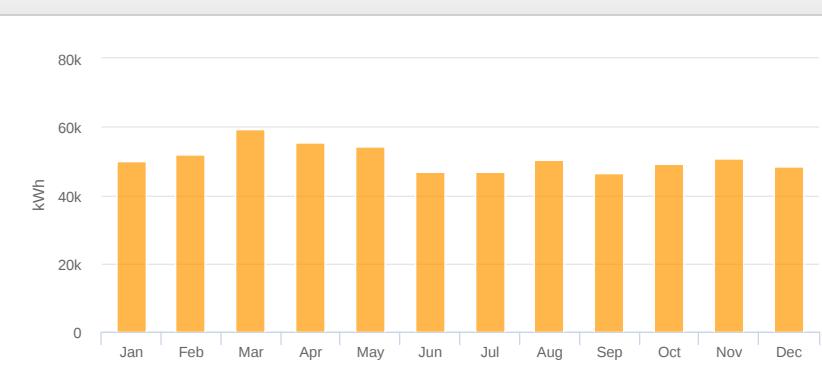
System Metrics

| | |
|-----------------------|---|
| Design | PLFIT-0001-OnGrid |
| Module DC Nameplate | 323.2 kW |
| Inverter AC Nameplate | 300.0 kW Load Ratio: 1.08 |
| Annual Production | 608.9 MWh |
| Performance Ratio | 80.4% |
| kWh/kWp | 1,884.1 |
| Weather Dataset | TMY, 0.04° Grid (19.53,-99.02), NREL (psm3) |
| Simulator Version | 7af19735fb-4508a83939-afc08618c4-657d257483 |

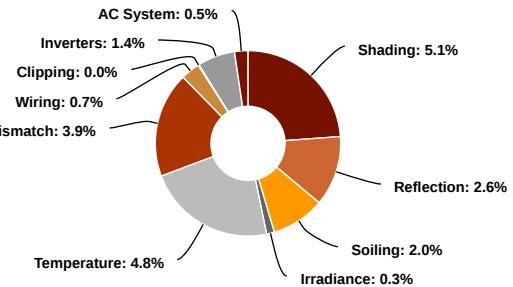
Project Location



Monthly Production



Sources of System Loss

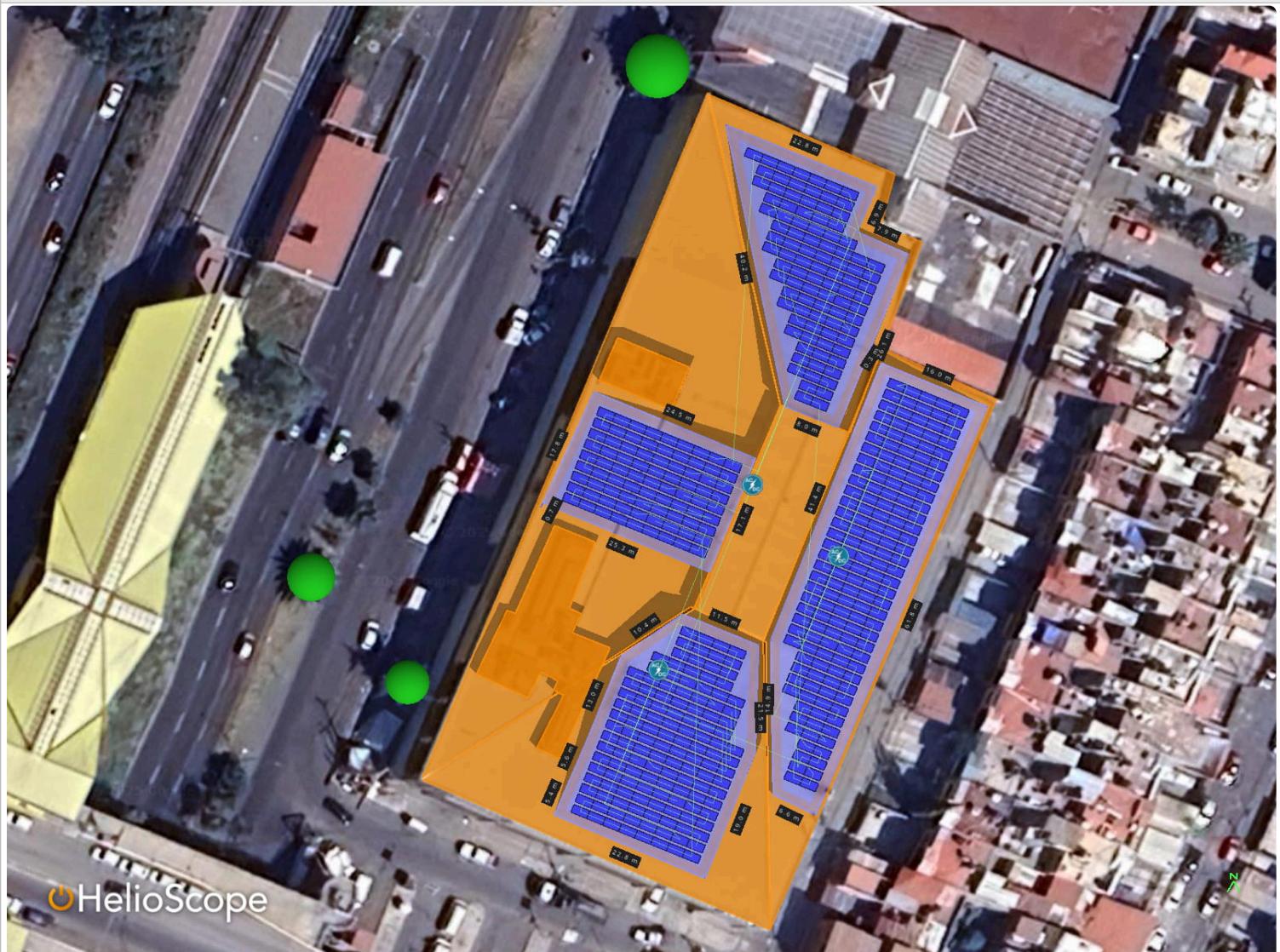


| ⚡ Annual Production | | | |
|-------------------------------------|-------------------------------------|------------------|--------------|
| | Description | Output | % Delta |
| Irradiance (kWh/m ²) | Annual Global Horizontal Irradiance | 2,241.4 | |
| | POA Irradiance | 2,342.4 | 4.5% |
| | Shaded Irradiance | 2,222.8 | -5.1% |
| | Irradiance after Reflection | 2,164.5 | -2.6% |
| | Irradiance after Soiling | 2,121.2 | -2.0% |
| | Total Collector Irradiance | 2,121.2 | 0.0% |
| Energy (kWh) | Nameplate | 685,810.5 | |
| | Output at Irradiance Levels | 683,804.8 | -0.3% |
| | Output at Cell Temperature Derate | 650,894.7 | -4.8% |
| | Output After Mismatch | 625,293.2 | -3.9% |
| | Optimal DC Output | 620,823.2 | -0.7% |
| | Constrained DC Output | 620,635.2 | 0.0% |
| | Inverter Output | 611,943.7 | -1.4% |
| | Energy to Grid | 608,884.0 | -0.5% |
| Temperature Metrics | | | |
| Avg. Operating Ambient Temp | | 19.3 °C | |
| Avg. Operating Cell Temp | | 32.7 °C | |
| Simulation Metrics | | | |
| Operating Hours | | 4367 | |
| Solved Hours | | 4367 | |

| ☁ Condition Set | | | | | | | | | | | |
|------------------------------|--|---|-------|-------------|---------|---|----------------------------------|---|---|---|---|
| Description | | Condition Set 1 | | | | | | | | | |
| Weather Dataset | | TMY, 0.04° Grid (19.53,-99.02), NREL (psm3) | | | | | | | | | |
| Solar Angle Location | | Meteo Lat/Lng | | | | | | | | | |
| Transposition Model | | Perez Model | | | | | | | | | |
| Temperature Model | | Sandia Model | | | | | | | | | |
| Temperature Model Parameters | Rack Type | | a | | b | | Temperature Delta | | | | |
| | Fixed Tilt | | -3.56 | | -0.075 | | 3°C | | | | |
| | Flush Mount | | -2.81 | | -0.0455 | | 0°C | | | | |
| | East-West | | -3.56 | | -0.075 | | 3°C | | | | |
| Soiling (%) | Carport | | -3.56 | | -0.075 | | 3°C | | | | |
| | J | F | M | A | M | J | J | A | S | O | N |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Irradiation Variance | | 5% | | | | | | | | | |
| Cell Temperature Spread | | 4° C | | | | | | | | | |
| Module Binning Range | | -2.5% to 2.5% | | | | | | | | | |
| AC System Derate | | 0.50% | | | | | | | | | |
| Module Characterizations | Module | | | Uploaded By | | | Characterization | | | | |
| | CS7N-695TB-AG (1000V) (Canadian Solar) | | | HelioScope | | | Spec Sheet Characterization, PAN | | | | |
| Component Characterizations | Device | | | Uploaded By | | | Characterization | | | | |
| | SUN2000-100KTL-M1 (380/400) (Huawei) | | | HelioScope | | | Spec Sheet | | | | |

| 📁 Components | | |
|--------------|--|----------------|
| Component | Name | Count |
| Inverters | SUN2000-100KTL-M1 (380/400) (Huawei) | 3 (300.0 kW) |
| Strings | 10 AWG (Copper) | 24 (919.5 m) |
| Module | Canadian Solar, CS7N-695TB-AG (1000V) (695W) | 465 (323.2 kW) |

| 📍 Wiring Zones | | | | | | | | | | | |
|------------------|------------|------------------------|-------------------------|----------------------------|------------------|--------------------|--------|---------|----------|--|--|
| Description | | Combiner Poles | | String Size | | Stringing Strategy | | | | | |
| Wiring Zone | | - | | 6-21 | | Along Racking | | | | | |
| 📍 Field Segments | | | | | | | | | | | |
| Description | Racking | Orientation | Tilt | Azimuth | Intrarow Spacing | Frame Size | Frames | Modules | Power | | |
| Field Segment 1 | Fixed Tilt | Landscape (Horizontal) | Module: 21° Surface: 5° | Module: 202° Surface: 112° | 0.4 m | 1x1 | 158 | 158 | 109.8 kW | | |
| Field Segment 2 | Fixed Tilt | Landscape (Horizontal) | Module: 21° Surface: 5° | Module: 202° Surface: 22° | 0.4 m | 1x1 | 94 | 94 | 65.3 kW | | |
| Field Segment 4 | Fixed Tilt | Landscape (Horizontal) | Module: 21° Surface: 5° | Module: 202° Surface: 292° | 0.4 m | 1x1 | 81 | 81 | 56.3 kW | | |
| Field Segment 3 | Fixed Tilt | Landscape (Horizontal) | Module: 21° Surface: 5° | Module: 202° Surface: 202° | 0.4 m | 1x1 | 132 | 132 | 91.7 kW | | |

[Detailed Layout2](#)



Near shadings parameter

| | |
|---------------------------|-------------------|
| New shading scene | |
| File of 02/17/25 at 16h39 | |
| Defined active PV fields | |
| Orientation | |
| Tilt | 21 ° |
| Azimuth | 90 ° |
| Table #2 | |
| area | 28 m ² |
| Table #3 | |
| area | 28 m ² |
| Table #4 | |
| area | 28 m ² |
| Table #5 | |
| area | 28 m ² |
| Table #6 | |
| area | 28 m ² |
| Table #7 | |
| area | 28 m ² |
| Table #8 | |
| area | 28 m ² |
| Table #9 | |
| area | 28 m ² |
| Table #10 | |
| area | 28 m ² |
| Table #11 | |
| area | 16 m ² |
| Table #12 | |
| area | 16 m ² |
| Table #13 | |
| area | 16 m ² |
| Table #14 | |
| area | 16 m ² |
| Table #15 | |
| area | 16 m ² |
| Table #16 | |
| area | 16 m ² |
| Table #17 | |
| area | 16 m ² |
| Table #18 | |
| area | 16 m ² |
| Table #19 | |
| area | 16 m ² |
| Table #20 | |
| area | 16 m ² |
| Table #21 | |
| area | 16 m ² |
| Table #22 | |
| area | 16 m ² |
| Table #23 | |
| area | 16 m ² |
| Table #24 | |
| area | 16 m ² |
| Table #25 | |
| area | 16 m ² |
| Table #26 | |
| area | 16 m ² |



Near shadings parameter

| | |
|--------------------------|-------------------|
| Defined active PV fields | |
| Table #27 | |
| area | 16 m ² |
| Table #28 | |
| area | 16 m ² |
| Table #29 | |
| area | 16 m ² |
| Table #30 | |
| area | 16 m ² |
| Table #31 | |
| area | 16 m ² |
| Table #32 | |
| area | 16 m ² |
| Table #33 | |
| area | 16 m ² |
| Table #34 | |
| area | 16 m ² |
| Table #35 | |
| area | 16 m ² |
| Table #36 | |
| area | 12 m ² |
| Table #37 | |
| area | 12 m ² |
| Table #38 | |
| area | 12 m ² |
| Table #39 | |
| area | 12 m ² |
| Table #40 | |
| area | 6 m ² |
| Table #41 | |
| area | 6 m ² |
| Table #42 | |
| area | 6 m ² |
| Table #43 | |
| area | 6 m ² |
| Table #44 | |
| area | 9 m ² |
| Table #45 | |
| area | 9 m ² |
| Table #46 | |
| area | 9 m ² |
| Table #47 | |
| area | 25 m ² |
| Table #48 | |
| area | 25 m ² |
| Table #49 | |
| area | 25 m ² |
| Table #50 | |
| area | 25 m ² |
| Table #51 | |
| area | 25 m ² |
| Table #52 | |
| area | 25 m ² |
| Table #53 | |
| area | 25 m ² |
| Table #54 | |
| area | 25 m ² |



Near shadings parameter

| | |
|--------------------------|-------------------|
| Defined active PV fields | |
| Table #55 | |
| area | 25 m ² |
| Table #56 | |
| area | 25 m ² |
| Table #57 | |
| area | 25 m ² |
| Table #58 | |
| area | 22 m ² |
| Table #59 | |
| area | 22 m ² |
| Table #61 | |
| area | 19 m ² |
| Table #62 | |
| area | 12 m ² |
| Table #63 | |
| area | 22 m ² |
| Table #64 | |
| area | 16 m ² |
| Table #65 | |
| area | 12 m ² |
| Table #67 | |
| area | 22 m ² |
| Table #68 | |
| area | 19 m ² |
| Table #69 | |
| area | 19 m ² |
| Table #70 | |
| area | 16 m ² |
| Table #71 | |
| area | 19 m ² |
| Table #72 | |
| area | 22 m ² |
| Table #73 | |
| area | 22 m ² |
| Table #74 | |
| area | 22 m ² |
| Table #75 | |
| area | 19 m ² |
| Table #76 | |
| area | 19 m ² |
| Table #77 | |
| area | 16 m ² |
| Table #78 | |
| area | 16 m ² |
| Table #79 | |
| area | 12 m ² |
| Table #80 | |
| area | 12 m ² |
| Table #81 | |
| area | 9 m ² |
| Table #82 | |
| area | 9 m ² |
| Table #83 | |
| area | 9 m ² |
| Table #84 | |
| area | 6 m ² |



PVsyst V8.0.6

Near shadings parameter

Defined active PV fields

Table #85

area

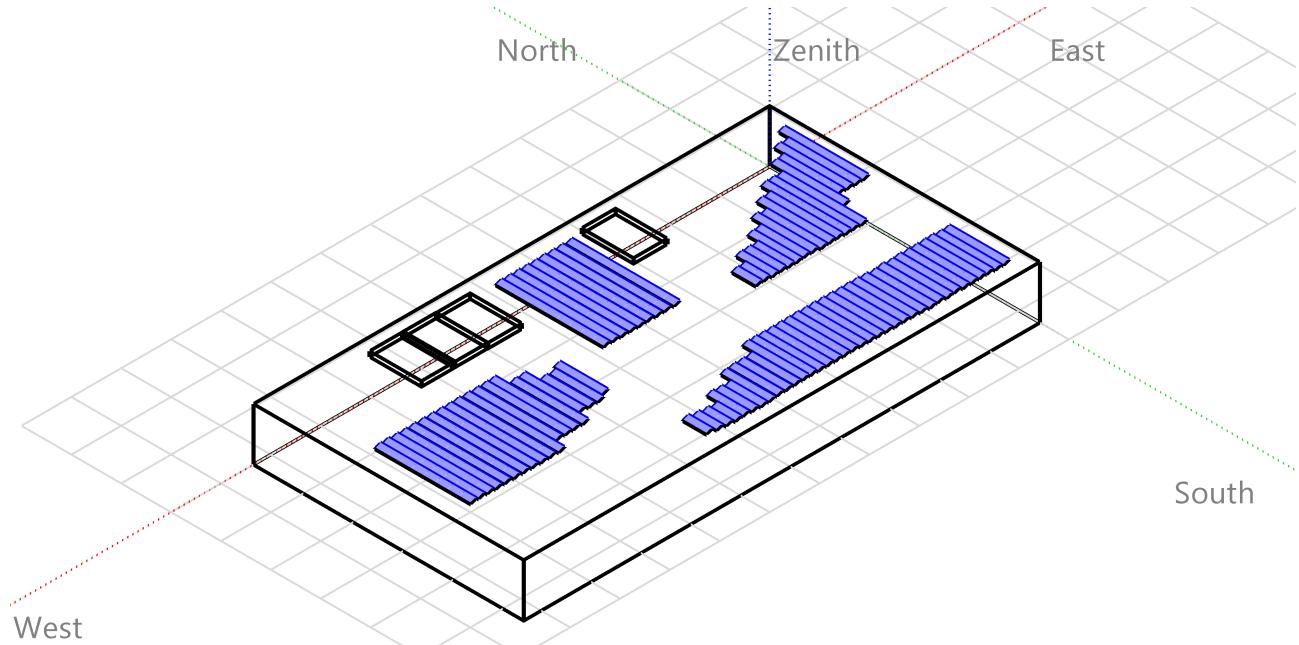
Table #86

area

6 m²

12 m²

Perspective of the PV-field and surrounding shading scene



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