**SIA “Enefit“**
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Latvija

**Contact person:**
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Mūkusalas iela 71, Zemgales priekšpilsēta, Rīga, LV-1004

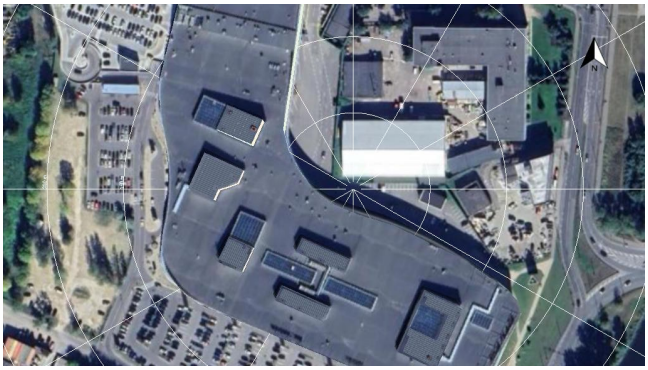
**Project Name:** Riga Plaza

24.07.2025

# Your PV system from SIA “Enefit“

## Address of Installation

Mūkusalas iela 71, Zemgales priekšpilsēta, Rīga, LV-1004



Project Description:
350 kW, Jumts V5, AIKO

# Project Overview

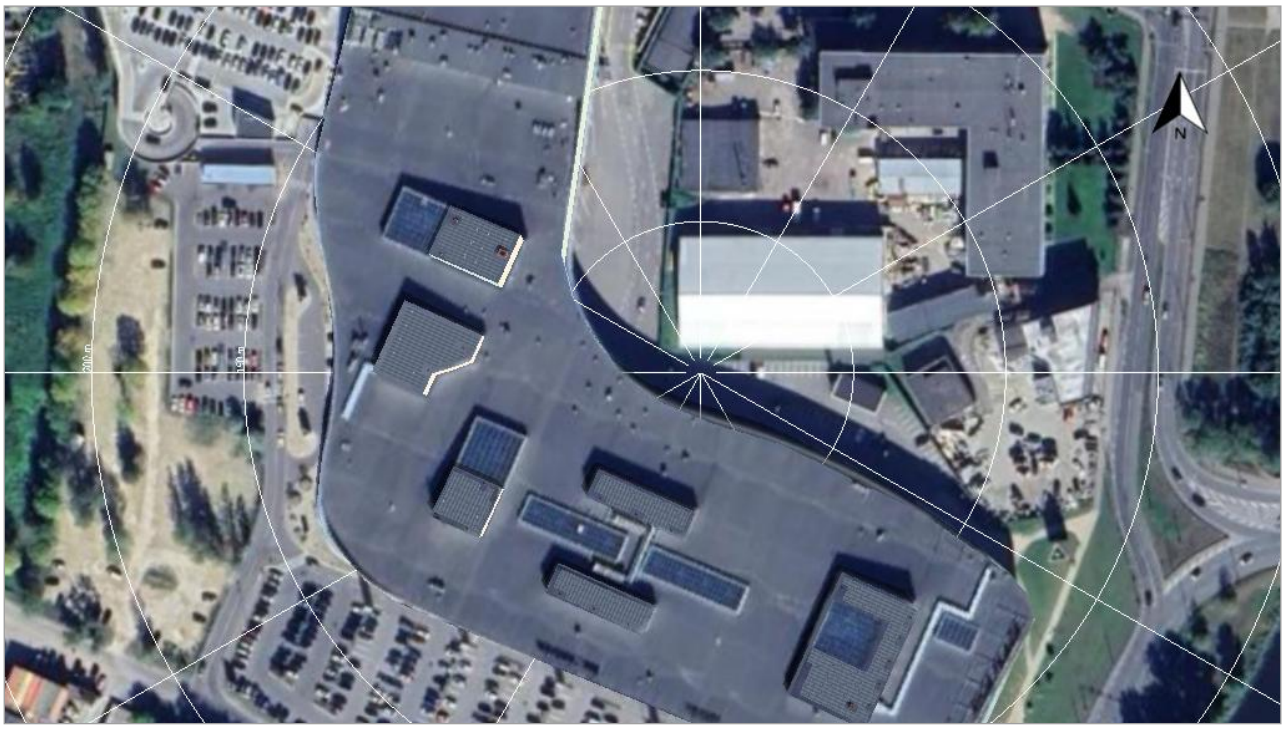



Figure: Overview Image, 3D Design

## PV System

3D, Grid-connected PV System with Electrical Appliances

| | | |
|---|---|---|
| Climate Data | Riga, LVA (2005 - 2016) | |
| Values source | PVGIS-SARAH/ERA-Interim | |
| PV Generator Output | 410,55 | kWp |
| PV Generator Surface | 1 783,7 | m² |
| Number of PV Modules | 805 | |
| Number of Inverters | 8 | |

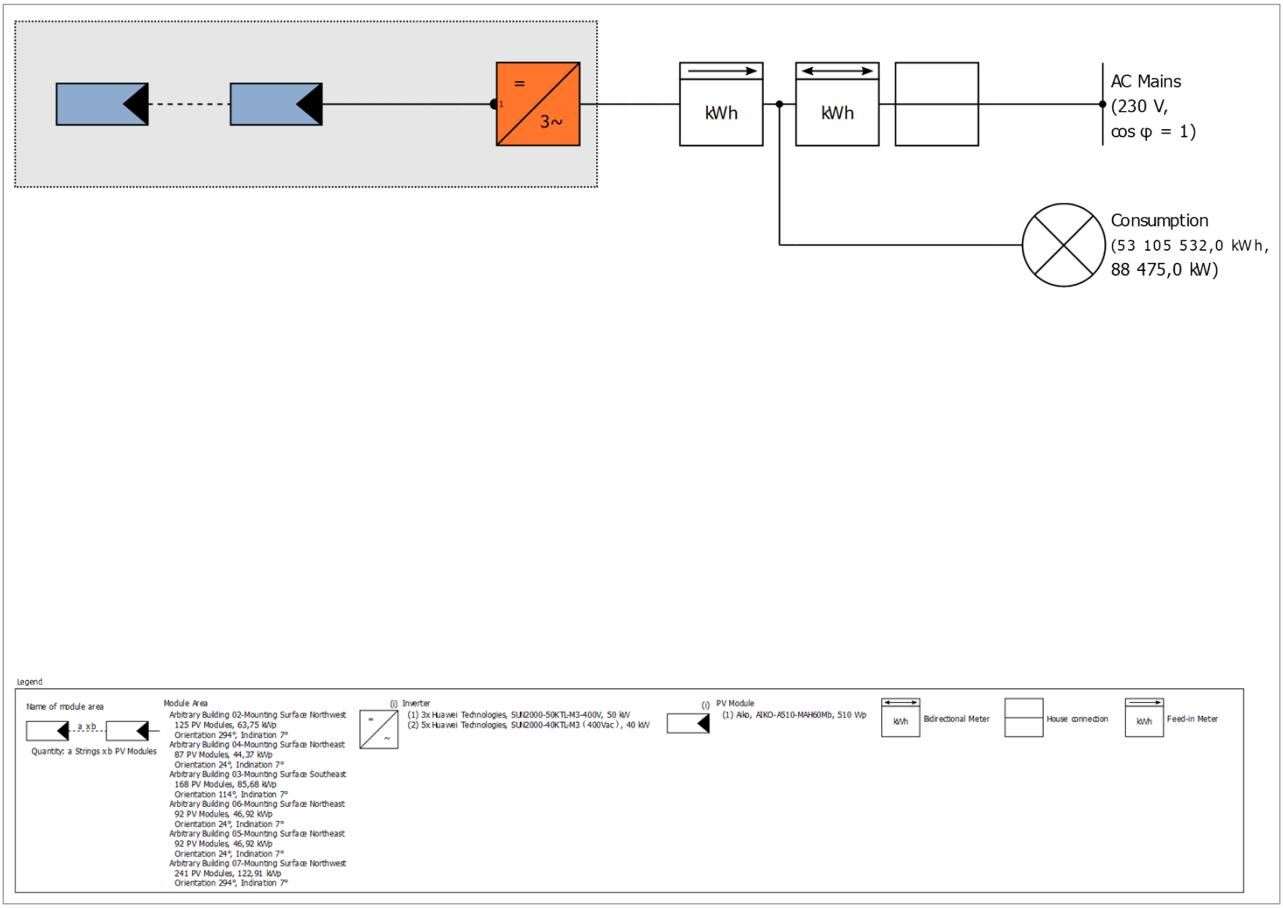



Figure: Schematic diagram

# Production Forecast

| Production Forecast | | |
|---|---|---|
| PV Generator Output | 410,55 | kWp |
| Spec. Annual Yield | 879,53 | kWh/kWp |
| Performance Ratio (PR) | 94,01 | % |
| Yield Reduction due to Shading | 1,8 | % |
| PV Generator Energy (AC grid) | 361 284 | kWh/Year |
| Own Consumption | 358 453 | kWh/Year |
| Clipping at Feed-in Point | 0 | kWh/Year |
| Grid Export | 2 831 | kWh/Year |
| Own Power Consumption | 99,2 | % |
| $CO_2$ Emissions avoided | 39 359 | kg / year |
| Level of Self-sufficiency | 0,7 | % |

The results have been calculated with a mathematical model calculation from Valentin Software GmbH (PV*SOL algorithms). The actual yields from the solar power system may differ as a result of weather variations, the efficiency of the modules and inverter, and other factors.

# Set-up of the System

## Overview

### System Data

| | |
|---|---|
| Type of System | 3D, Grid-connected PV System with Electrical Appliances |

### Climate Data

| | |
|---|---|
| Location | Riga, LVA (2005 - 2016) |
| Values source | PVGIS-SARAH/ERA-Interim |
| Data resolution | 1 h |
| Simulation models used: | |
| - Diffuse Irradiation onto Horizontal Plane | Hofmann |
| - Irradiance onto tilted surface | Hay & Davies |

### Consumption

| | |
|---|---|
| Total Consumption | 53105532 kWh |
| Xst | 53105532 kWh |
| Load Peak | 88475 kW |

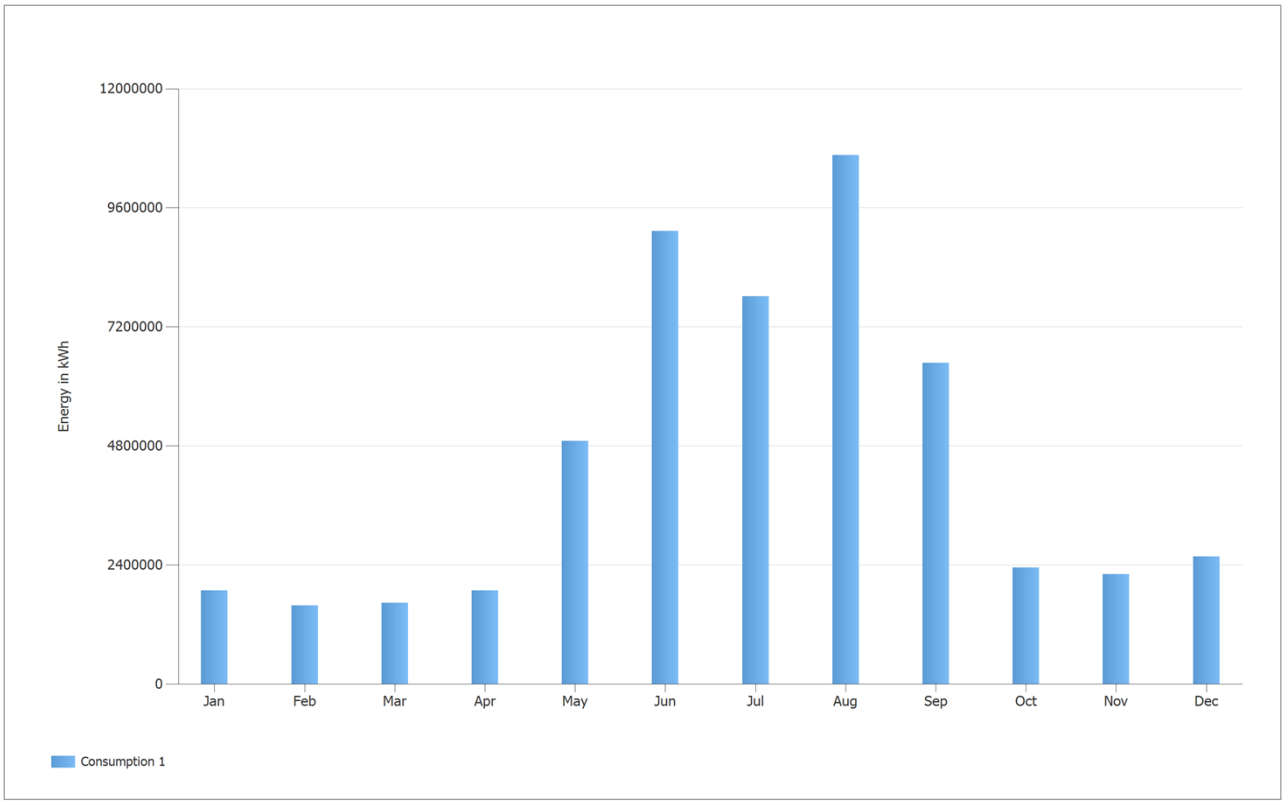



Figure: Consumption

# Module Areas

## 1. Module Area - Arbitrary Building 02-Mounting Surface Northwest

### PV Generator, 1. Module Area - Arbitrary Building 02-Mounting Surface Northwest

| | |
|---|---|
| Name | Arbitrary Building 02-Mounting Surface Northwest |
| PV Modules | 125 x AIKO-A510-MAH60Mb (v1) |
| Manufacturer | Aiko |
| Inclination | 7 ° |
| Orientation | Northwest 294 ° |
| Installation Type | Roof parallel |
| PV Generator Surface | 277,0 m² |

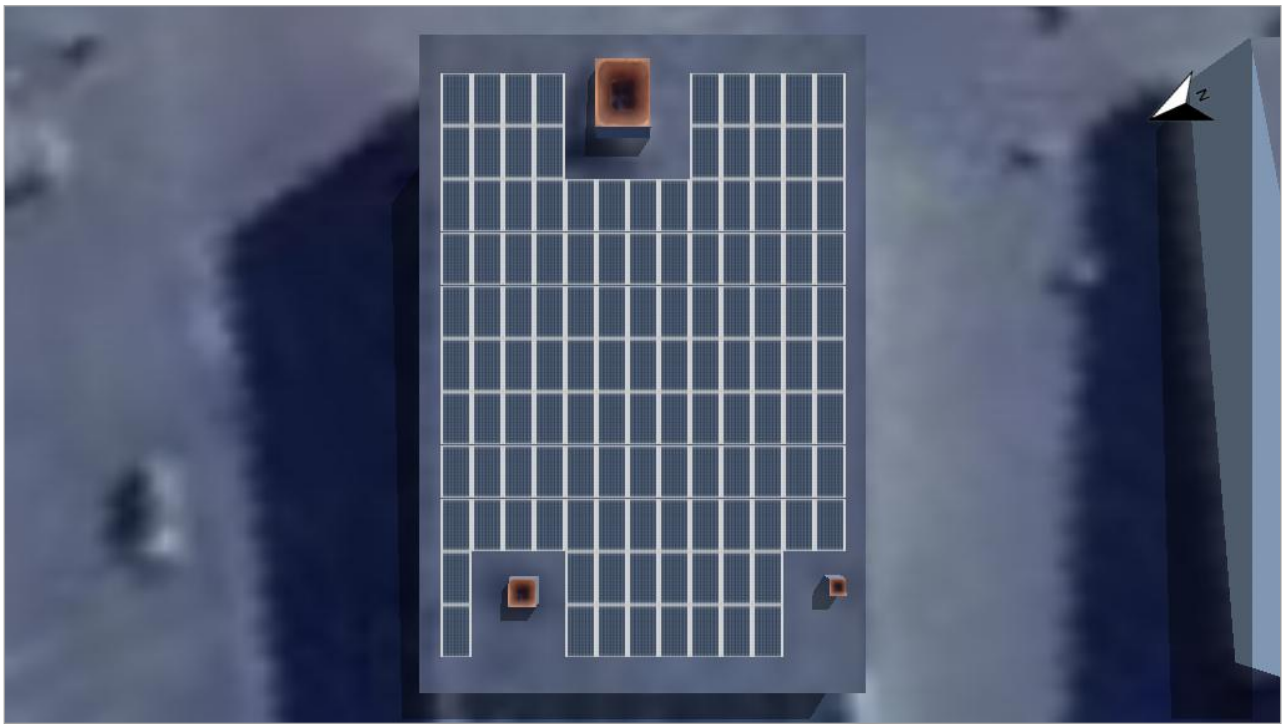


Figure: 1. Module Area - Arbitrary Building 02-Mounting Surface Northwest

## 2. Module Area - Arbitrary Building 04-Mounting Surface Northeast

### PV Generator, 2. Module Area - Arbitrary Building 04-Mounting Surface Northeast

| | |
|---|---|
| Name | Arbitrary Building 04-Mounting Surface Northeast |
| PV Modules | 87 x AIKO-A510-MAH60Mb (v1) |
| Manufacturer | Aiko |
| Inclination | 7 ° |
| Orientation | Northeast 24 ° |
| Installation Type | Roof parallel |
| PV Generator Surface | 192,8 m² |

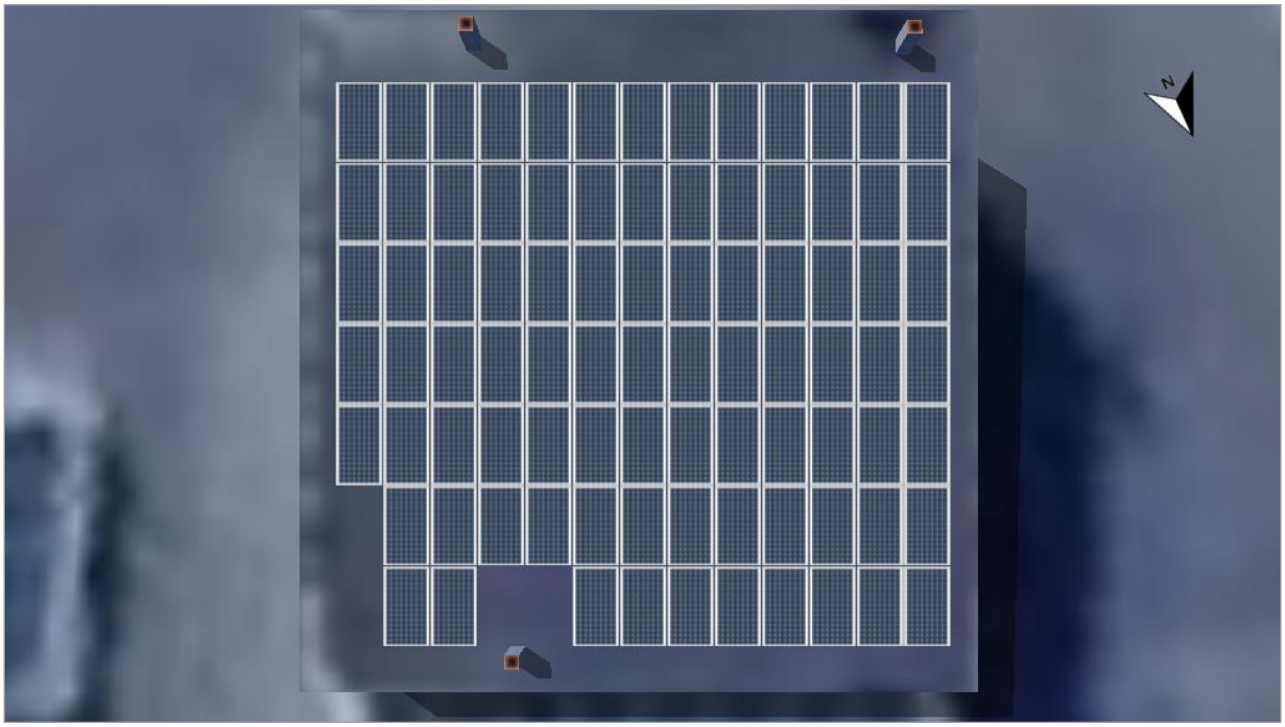


Figure: 2. Module Area - Arbitrary Building 04-Mounting Surface Northeast

## 3. Module Area - Arbitrary Building 03-Mounting Surface Southeast

### PV Generator, 3. Module Area - Arbitrary Building 03-Mounting Surface Southeast

| | | |
|---|---|---|
| Name | Arbitrary Building 03-Mounting Surface Southeast | |
| PV Modules | 168 x AIKO-A510-MAH60Mb (v1) | |
| Manufacturer | Aiko | |
| Inclination | 7 | ° |
| Orientation | Southeast 114 | ° |
| Installation Type | Roof parallel | |
| PV Generator Surface | 372,3 | m² |



Figure: 3. Module Area - Arbitrary Building 03-Mounting Surface Southeast

## 4. Module Area - Arbitrary Building 06-Mounting Surface Northeast

### PV Generator, 4. Module Area - Arbitrary Building 06-Mounting Surface Northeast

| | |
|---|---|
| Name | Arbitrary Building 06-Mounting Surface Northeast |
| PV Modules | 92 x AIKO-A510-MAH60Mb (v1) |
| Manufacturer | Aiko |
| Inclination | 7 ° |
| Orientation | Northeast 24 ° |
| Installation Type | Roof parallel |
| PV Generator Surface | 203,9 m² |

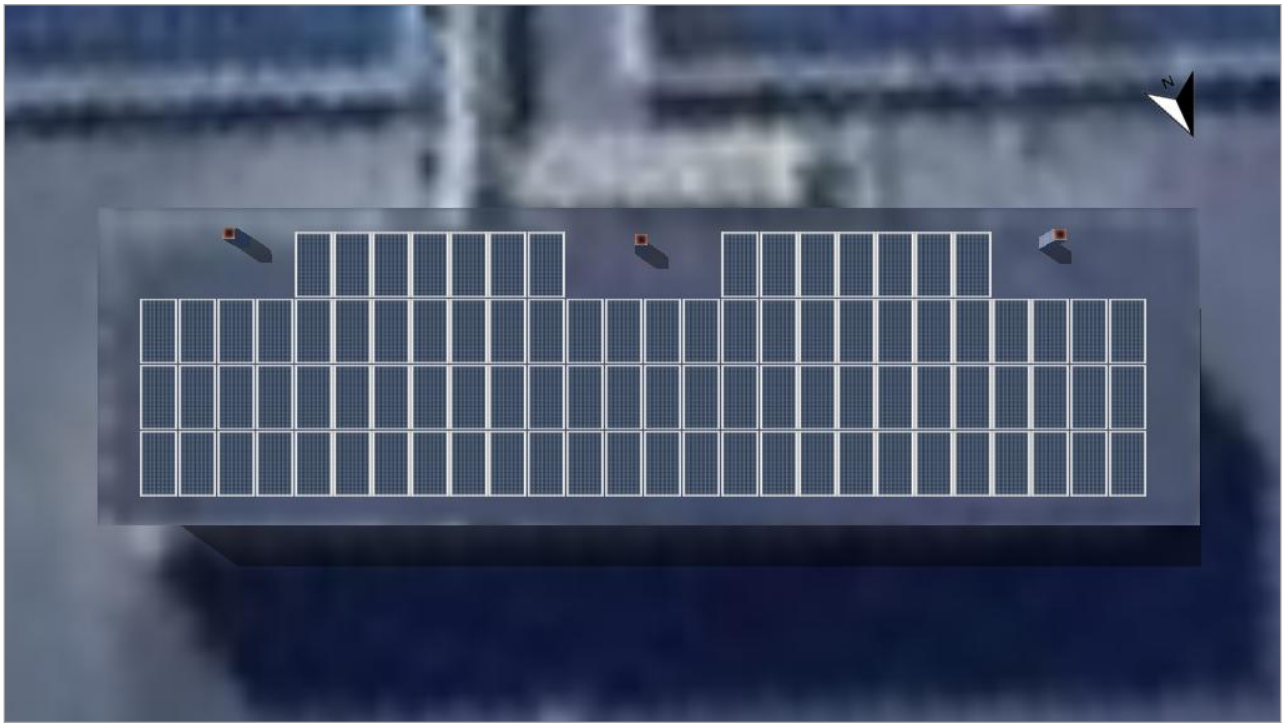



Figure: 4. Module Area - Arbitrary Building 06-Mounting Surface Northeast

## 5. Module Area - Arbitrary Building 05-Mounting Surface Northeast

### PV Generator, 5. Module Area - Arbitrary Building 05-Mounting Surface Northeast

| | | |
|---|---|---|
| Name | Arbitrary Building 05-Mounting Surface Northeast | |
| PV Modules | 92 x AIKO-A510-MAH60Mb (v1) | |
| Manufacturer | Aiko | |
| Inclination | 7 | ° |
| Orientation | Northeast 24 | ° |
| Installation Type | Roof parallel | |
| PV Generator Surface | 203,9 | m² |

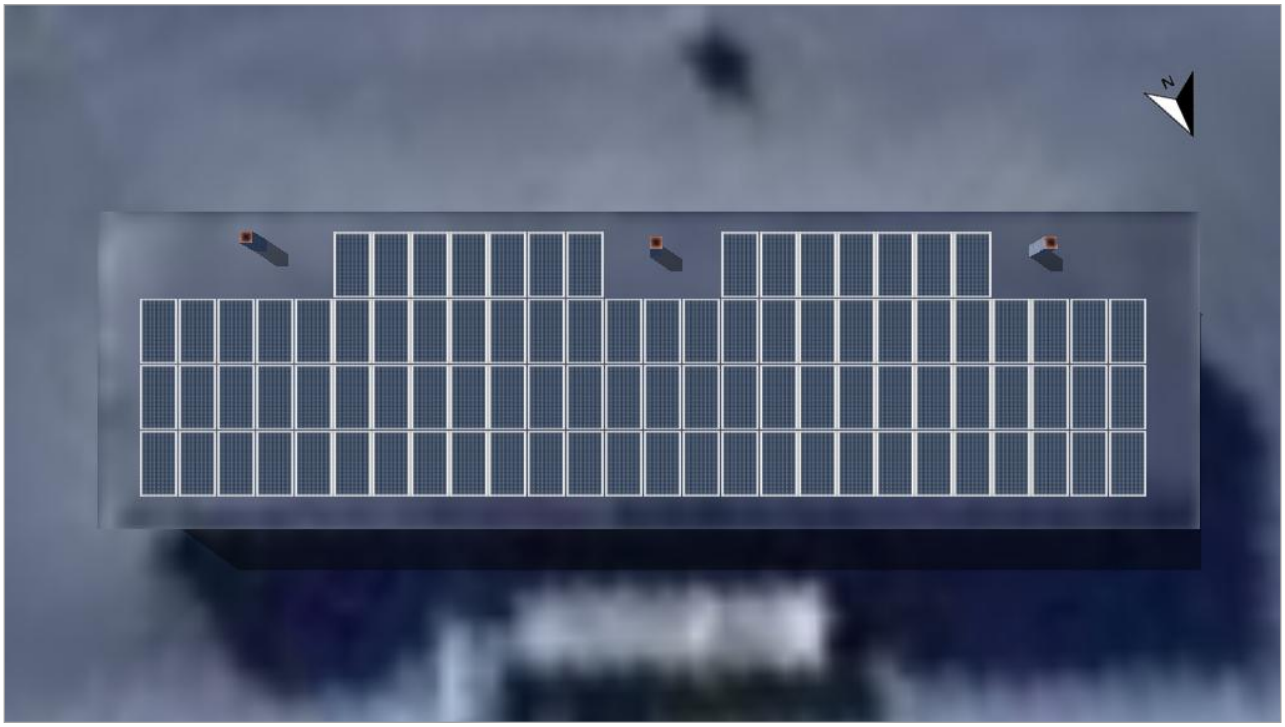



Figure: 5. Module Area - Arbitrary Building 05-Mounting Surface Northeast

## 6. Module Area - Arbitrary Building 07-Mounting Surface Northwest

### PV Generator, 6. Module Area - Arbitrary Building 07-Mounting Surface Northwest

| | |
|---|---|
| Name | Arbitrary Building 07-Mounting Surface Northwest |
| PV Modules | 241 x AIKO-A510-MAH60Mb (v1) |
| Manufacturer | Aiko |
| Inclination | 7 ° |
| Orientation | Northwest 294 ° |
| Installation Type | Roof parallel |
| PV Generator Surface | 534,0 m² |

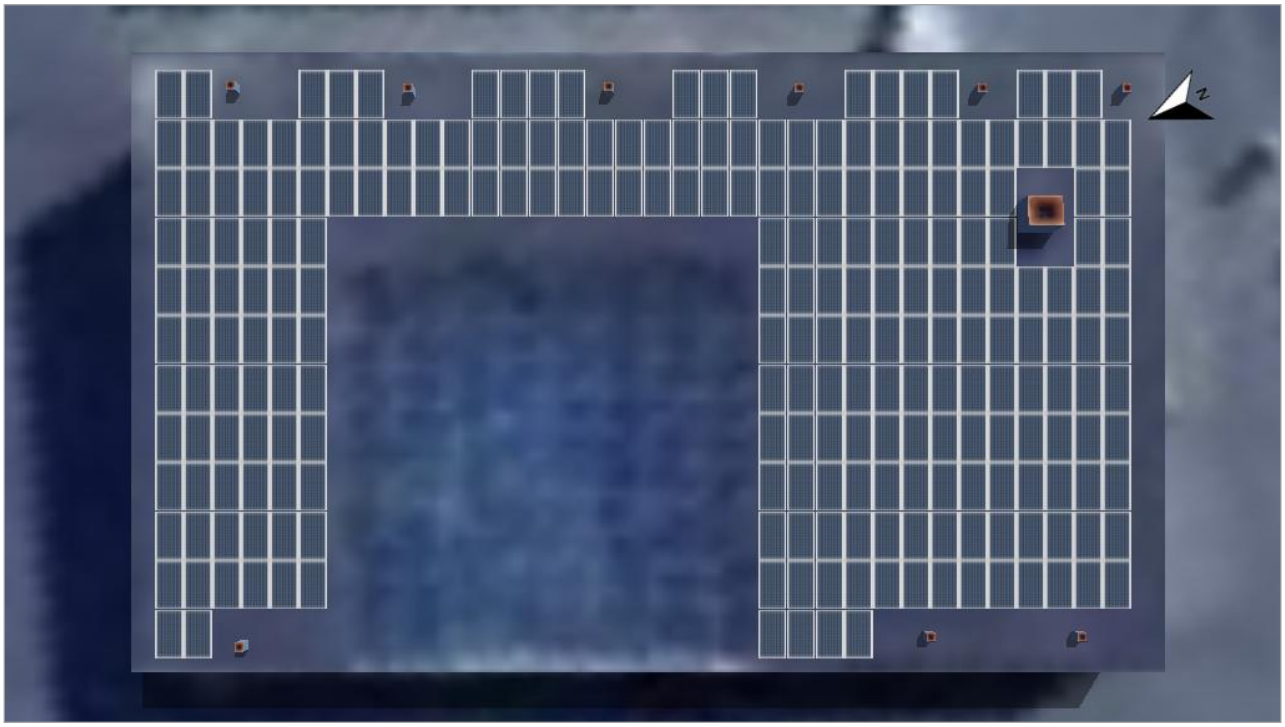


Figure: 6. Module Area - Arbitrary Building 07-Mounting Surface Northwest

# Horizon Line, 3D Design

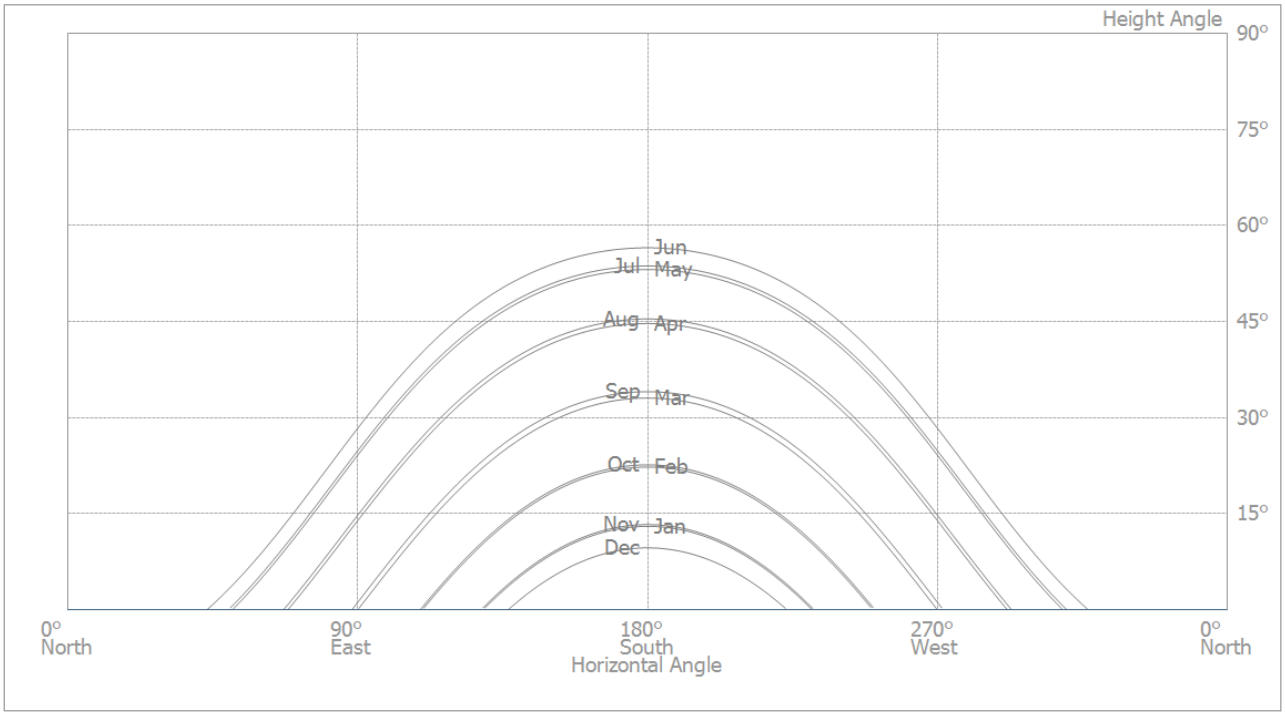



Figure: Horizon (3D Design)

# AC Mains

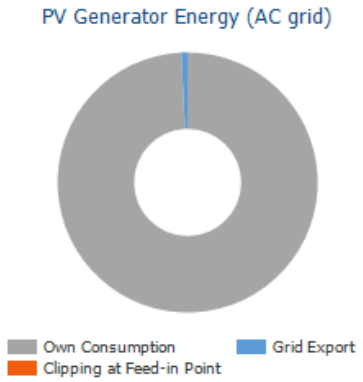
| AC Mains | |
|---|---|
| Number of Phases | 3 |
| Mains voltage between phase and neutral | 230 V |
| Displacement Power Factor (cos phi) | +/- 1 |
| Maximum Feed-in Power Clipping | 350 kW |

# Simulation Results

## Results Total System

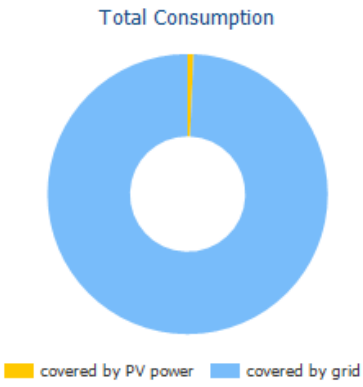
### PV System

| | | |
|---|---|---|
| PV Generator Output | 410,55 | kWp |
| Spec. Annual Yield | 879,53 | kWh/kWp |
| Performance Ratio (PR) | 94,01 | % |
| Yield Reduction due to Shading | 1,8 | % |
| PV Generator Energy (AC grid) | 361 284 | kWh/Year |
| Own Consumption | 358 453 | kWh/Year |
| Clipping at Feed-in Point | 0 | kWh/Year |
| Grid Export | 2 831 | kWh/Year |
| Own Power Consumption | 99,2 | % |
| $CO_2$ Emissions avoided | 39 359 | kg / year |




### Appliances

| | | |
|---|---|---|
| Appliances | 53 105 532 | kWh/Year |
| Standby Consumption (Inverter) | 193 | kWh/Year |
| Total Consumption | 53 105 725 | kWh/Year |
| covered by PV power | 358 453 | kWh/Year |
| covered by grid | 52 747 273 | kWh/Year |
| Solar Fraction | 0,7 | % |




### Level of Self-sufficiency

| | | |
|---|---|---|
| Total Consumption | 53 105 725 | kWh/Year |
| covered by grid | 52 747 273 | kWh/Year |
| Level of Self-sufficiency | 0,7 | % |

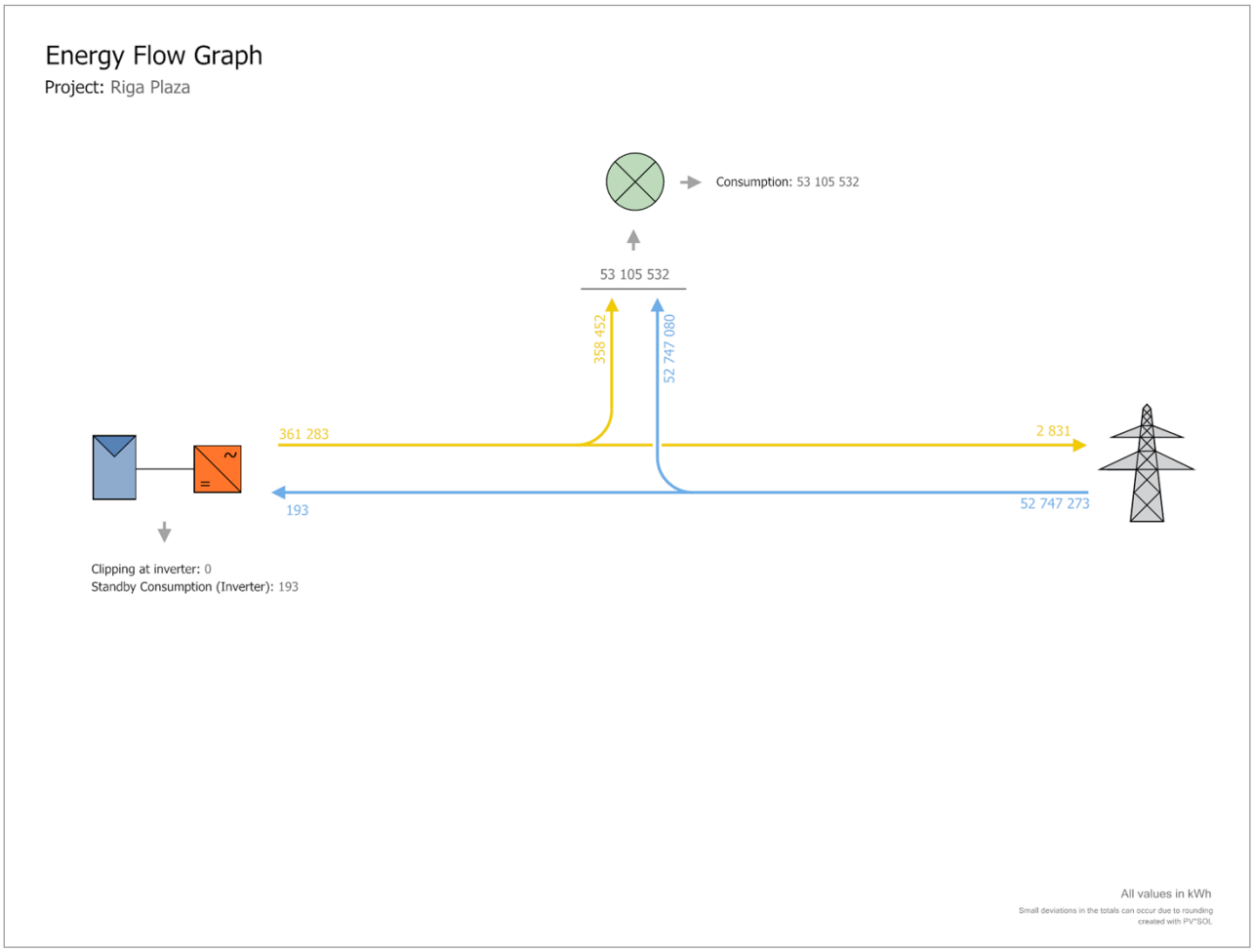



Figure: Energy flow

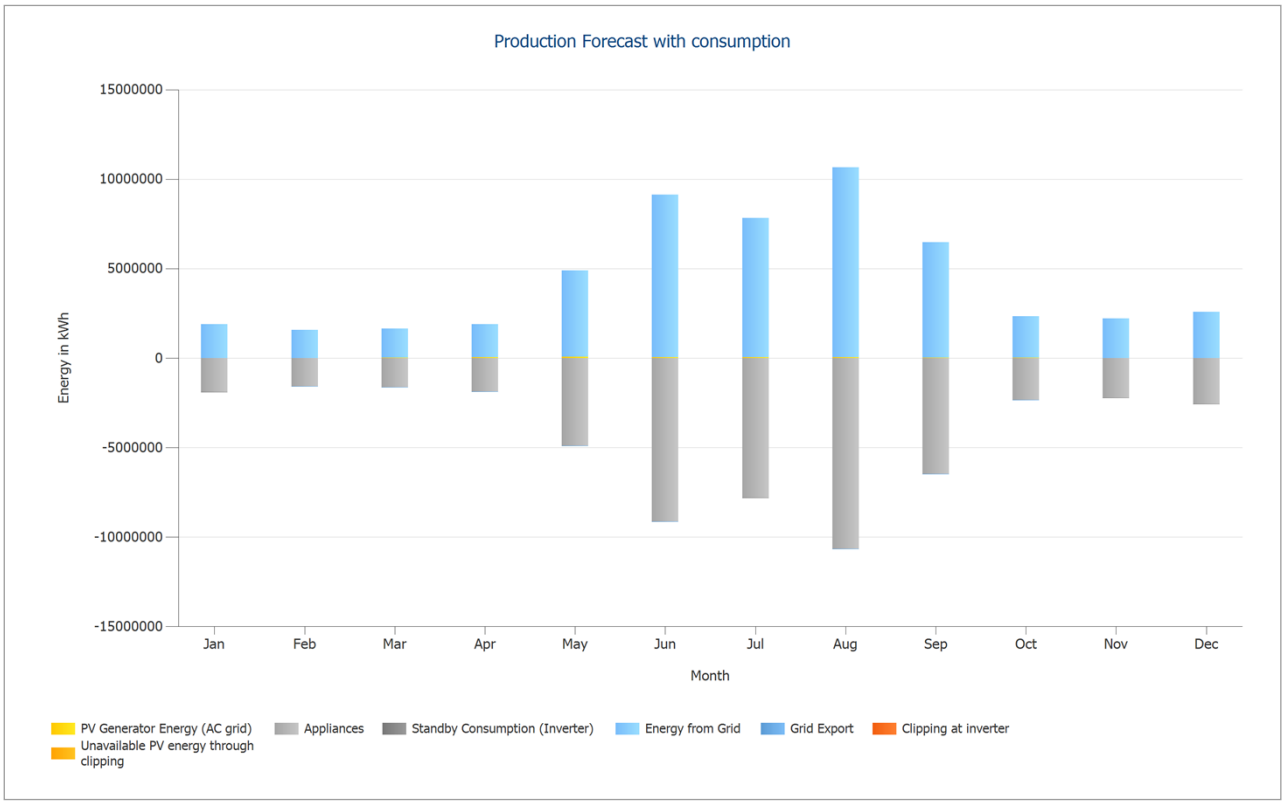



Figure: Production Forecast with consumption

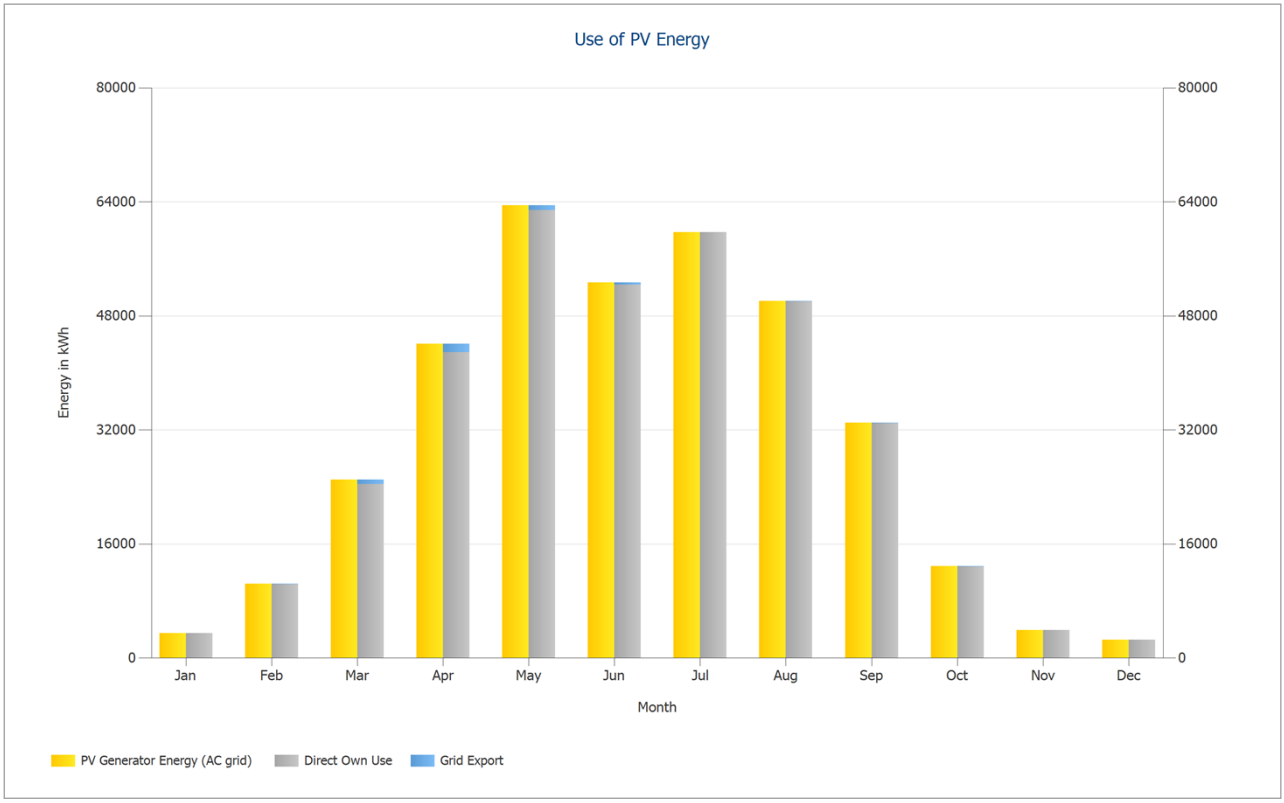



Figure: Use of PV Energy

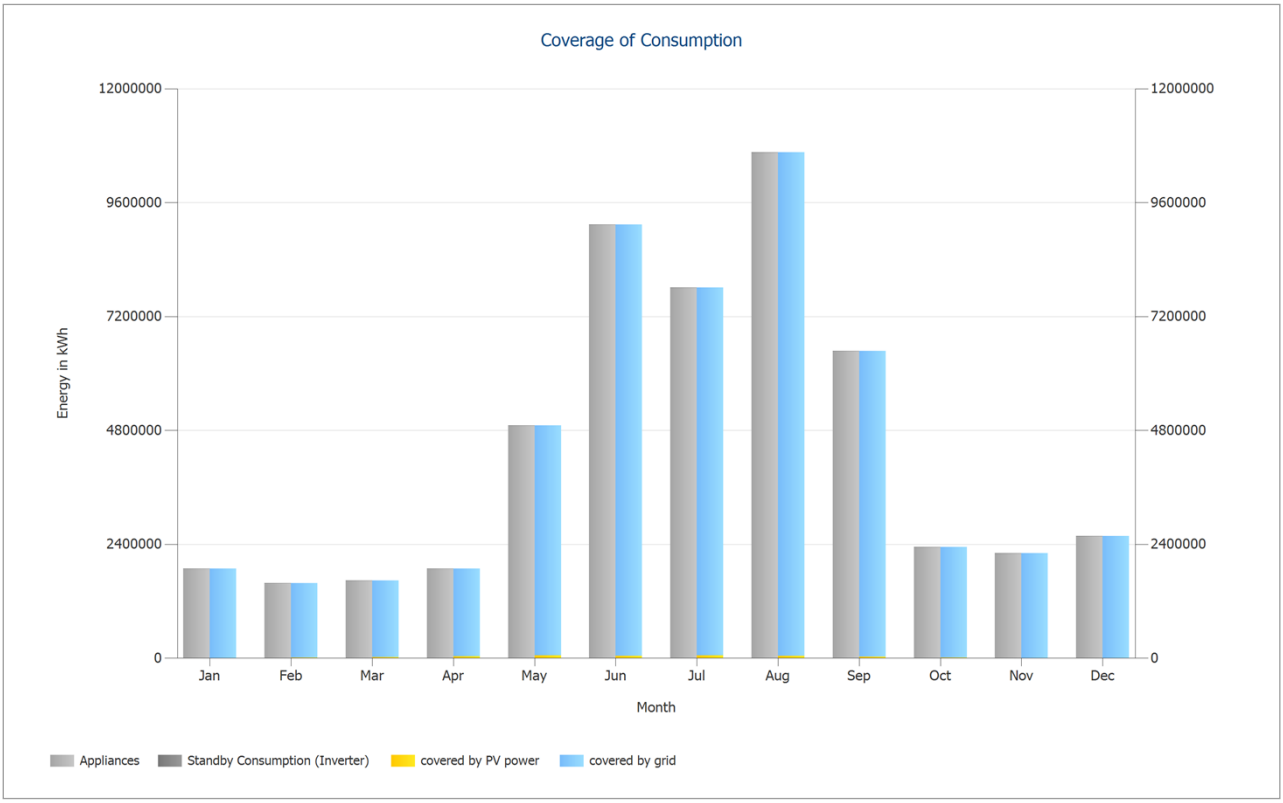



Figure: Coverage of Consumption

# PV System Energy Balance

## PV System Energy Balance

| | | | |
|---|---|---|---|
| **Global radiation - horizontal** | **973,53** | **kWh/m²** | |
| Deviation from standard spectrum | -9,74 | kWh/m² | -1,00 % |
| Ground Reflection (Albedo) | 0,72 | kWh/m² | 0,07 % |
| Orientation and inclination of the module surface | -27,92 | kWh/m² | -2,89 % |
| Module-independent shading | -1,32 | kWh/m² | -0,14 % |
| Reflection on the Module Surface | 0,00 | kWh/m² | 0,00 % |
| **Global Radiation at the Module** | **935,28** | **kWh/m²** | |
| | | | |
| | 935,28 | kWh/m² | |
| | x 1783,748 | m² | |
| | = 1 668 298,98 | kWh | |
| | | | |
| **Global PV Radiation** | **1 668 298,98** | **kWh** | |
| Soiling | 0,00 | kWh | 0,00 % |
| STC Conversion (Rated Efficiency of Module 23,02 %) | -1 284 201,17 | kWh | -76,98 % |
| **Rated PV Energy** | **384 097,80** | **kWh** | |
| Module-specific Partial Shading | -3 240,15 | kWh | -0,84 % |
| Low-light performance | 151,81 | kWh | 0,04 % |
| Deviation from the nominal module temperature | -801,57 | kWh | -0,21 % |
| Diodes | -237,10 | kWh | -0,06 % |
| Mismatch (Manufacturer Information) | -7 599,42 | kWh | -2,00 % |
| Mismatch (Configuration/Shading) | -2 760,27 | kWh | -0,74 % |
| **PV Energy (DC) without inverter clipping** | **369 611,11** | **kWh** | |
| Failing to reach the DC start output | -8,76 | kWh | 0,00 % |
| Clipping on account of the MPP Voltage Range | 0,00 | kWh | 0,00 % |
| Clipping on account of the max. DC Current | 0,00 | kWh | 0,00 % |
| Clipping on account of the max. DC Power | 0,00 | kWh | 0,00 % |
| Clipping on account of the max. AC Power/cos phi | 0,00 | kWh | 0,00 % |
| MPP Matching | -51,80 | kWh | -0,01 % |
| **PV energy (DC)** | **369 550,55** | **kWh** | |
| | | | |
| **Energy at the Inverter Input** | **369 550,55** | **kWh** | |
| Input voltage deviates from rated voltage | -557,74 | kWh | -0,15 % |
| DC/AC Conversion | -7 709,09 | kWh | -2,09 % |
| Standby Consumption (Inverter) | -193,46 | kWh | -0,05 % |
| Total Cable Losses | 0,00 | kWh | 0,00 % |
| **PV energy (AC) minus standby use** | **361 090,26** | **kWh** | |
| **PV Generator Energy (AC grid)** | **361 283,72** | **kWh** | |

# Plans and parts list

## Parts list

Parts list

| # | Type | Item number | Manufacturer | Name | Quantity | Unit |
|---|---|---|---|---|---|---|
| 1 | PV Module | | Aiko | AIKO-A510-MAH60Mb | 805 | Piece |
| 2 | Inverter | | Huawei Technologies | SUN2000-50KTL-M3-400V | 3 | Piece |
| 3 | Inverter | | Huawei Technologies | SUN2000-40KTL-M3 （400Vac） | 5 | Piece |
| 4 | Components | | | Feed-in Meter | 1 | Piece |
| 5 | Components | | | House connection | 1 | Piece |
| 6 | Components | | | Bidirectional Meter | 1 | Piece |