CorEnergy
Enterprise Point, Altrincham Rd, Sharston
M22 9AF
United Kingdom

Project Name: Sainsbury's - St Clares

17/10/2024

Documentation

Customer Details

Company	Sainsbury's
Customer Number	
Contact person	
Address	
Phone	
Fax	
E-Mail	

Project Data

Project Name	Sainsbury's - St Clares
Offer no.	
Project Designer	James Burke
Address	Sainsbury's, 303 Uxbridge Rd, Hampton Hill, Hampton TW12 1AW

Project Description:
Rooftop PV

Project Designer: James Burke **Client:** Sainsbury's

Project Overview

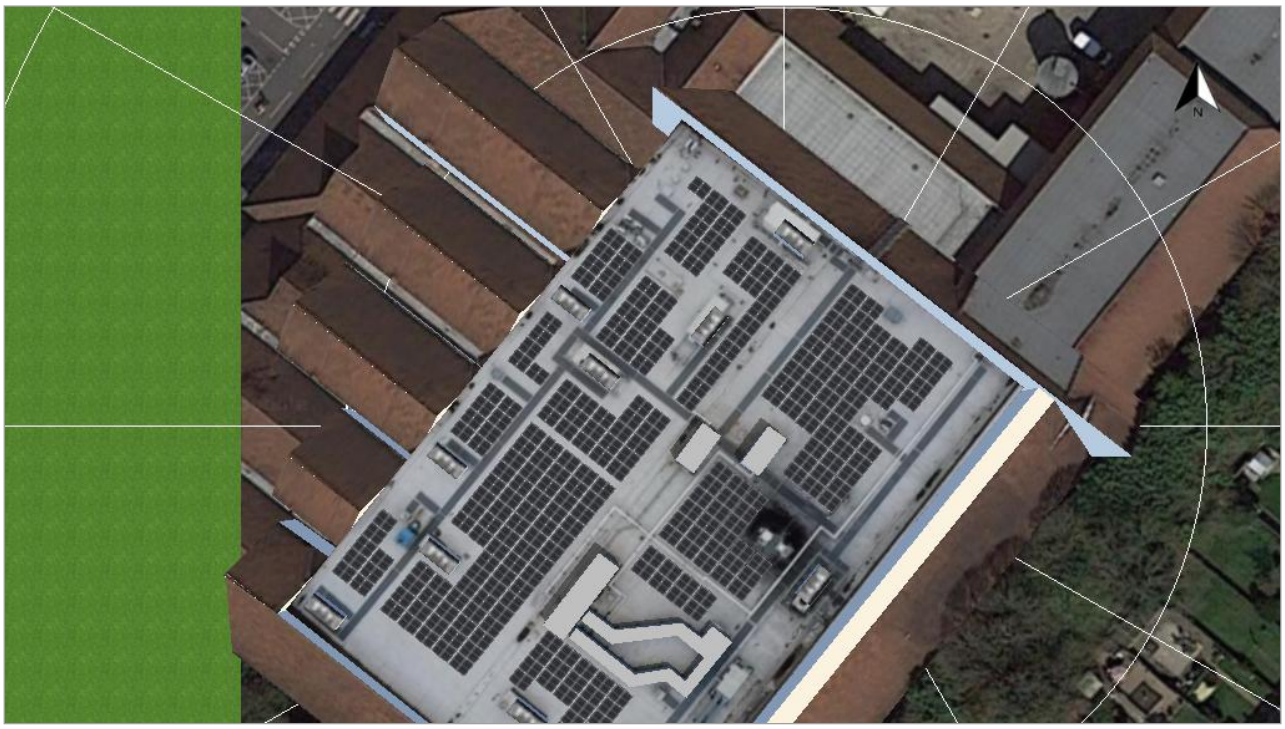


Figure: Overview Image, 3D Design

PV System

3D, Grid-connected PV System with Electrical Appliances

Climate Data	Feltham, GBR (2001 - 2020)	
Values source	Meteonorm 8.2(i)	
PV Generator Output	226.1	kWp
PV Generator Surface	1,063.0	m²
Number of PV Modules	532	
Number of Inverters	2	

Sainsbury's - St Clares

Project Designer: James Burke **Client:** Sainsbury's

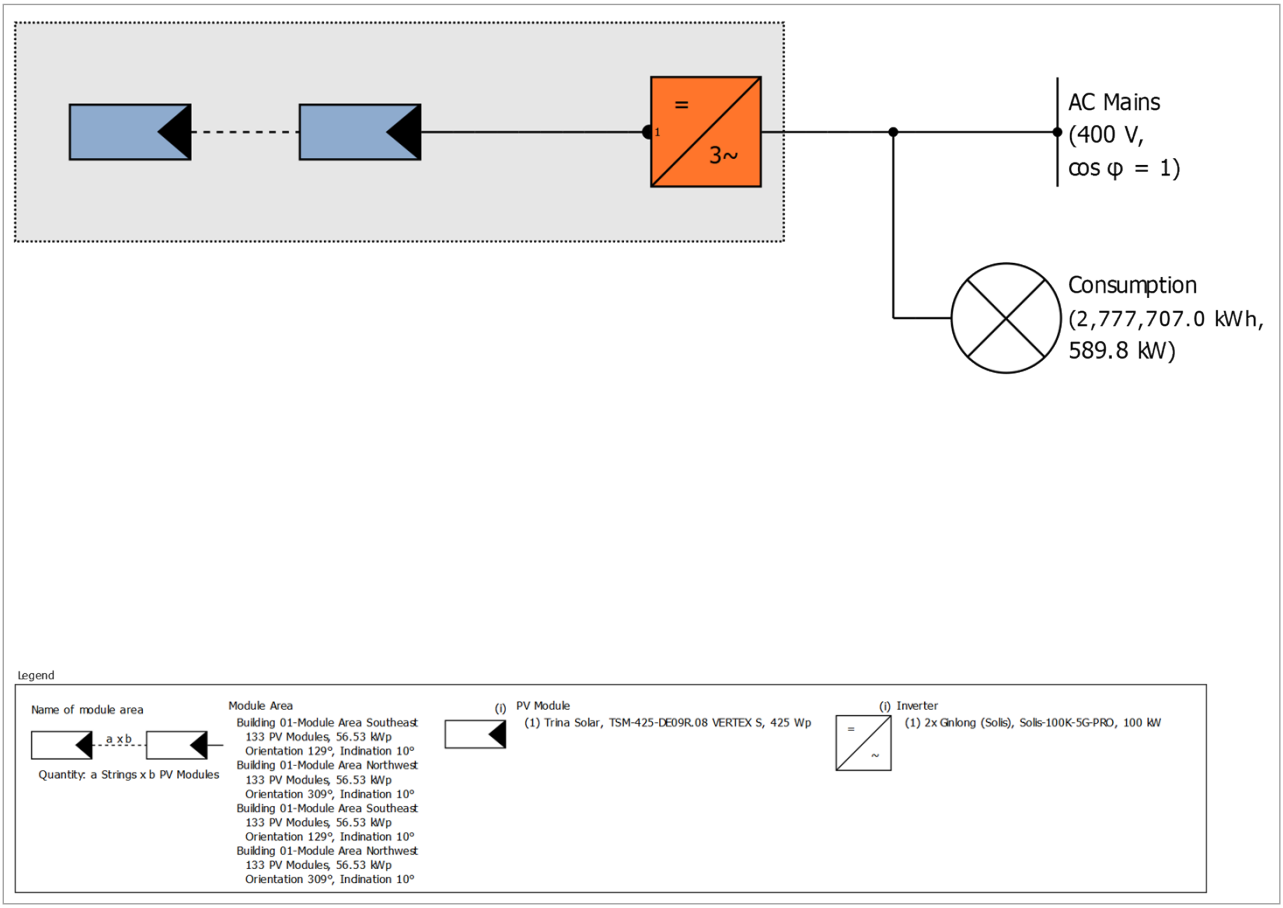


Figure: Schematic diagram

Production Forecast

Production Forecast

PV Generator Output	226.10 kWp
Spec. Annual Yield	867.87 kWh/kWp
Performance Ratio (PR)	87.45 %
Yield Reduction due to Shading	6.7 %
PV Generator Energy (AC grid)	196,240 kWh/Year
Own Consumption	188,209 kWh/Year
Clipping at Feed-in Point	0 kWh/Year
Grid Export	8,031 kWh/Year
Own Power Consumption	95.9 %
CO_2 Emissions avoided	44,151 kg / year
Level of Self-sufficiency	6.8 %

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
Start of Operation	01/01/2025

Climate Data

Location	Feltham, GBR (2001 - 2020)
Values source	Meteonorm 8.2(i)
Resolution of the data	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Reindl reduced
- Irradiance onto tilted surface	Perez

Consumption

Total Consumption	2777707 kWh
St Clares	2777707 kWh
Load Peak	589.8 kW

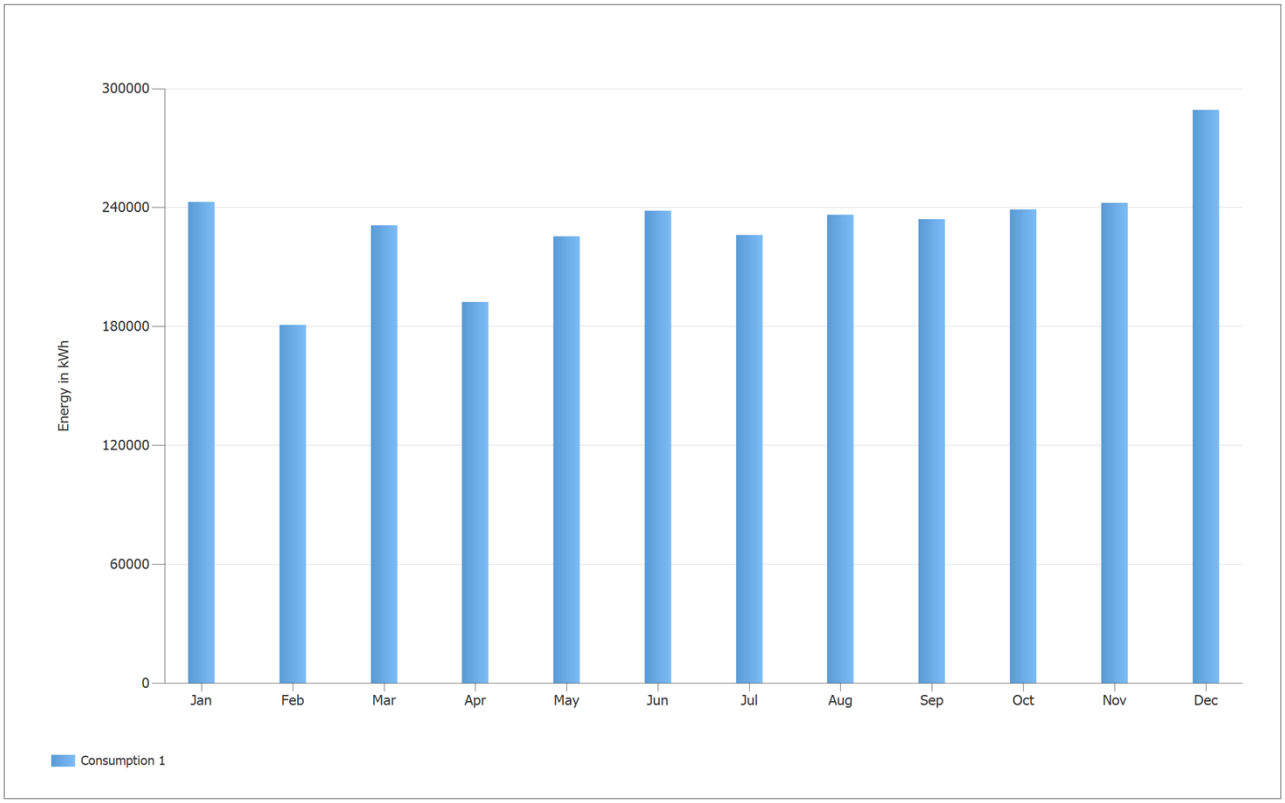


Figure: Consumption

Module Areas

1. Module Area - Building 01-Module Area Southeast

PV Generator, 1. Module Area - Building 01-Module Area Southeast

Name	Building 01-Module Area Southeast	
PV Modules	133 x TSM-425-DE09R.08 VERTEX S (v1)	
Manufacturer	Trina Solar	
Inclination	10	°
Orientation	Southeast 129	°
Installation Type	Mounted - Roof	
PV Generator Surface	265.7	m²

Figure: 1. Module Area - Building 01-Module Area Southeast

Project Designer: James Burke **Client:** Sainsbury's

Degradation of Module, 1. Module Area - Building 01-Module Area Southeast

Characteristic curve	Exponential
Remaining power (power output) after 1 year	99 %
Remaining power (power output) after 30 years	87.4 %

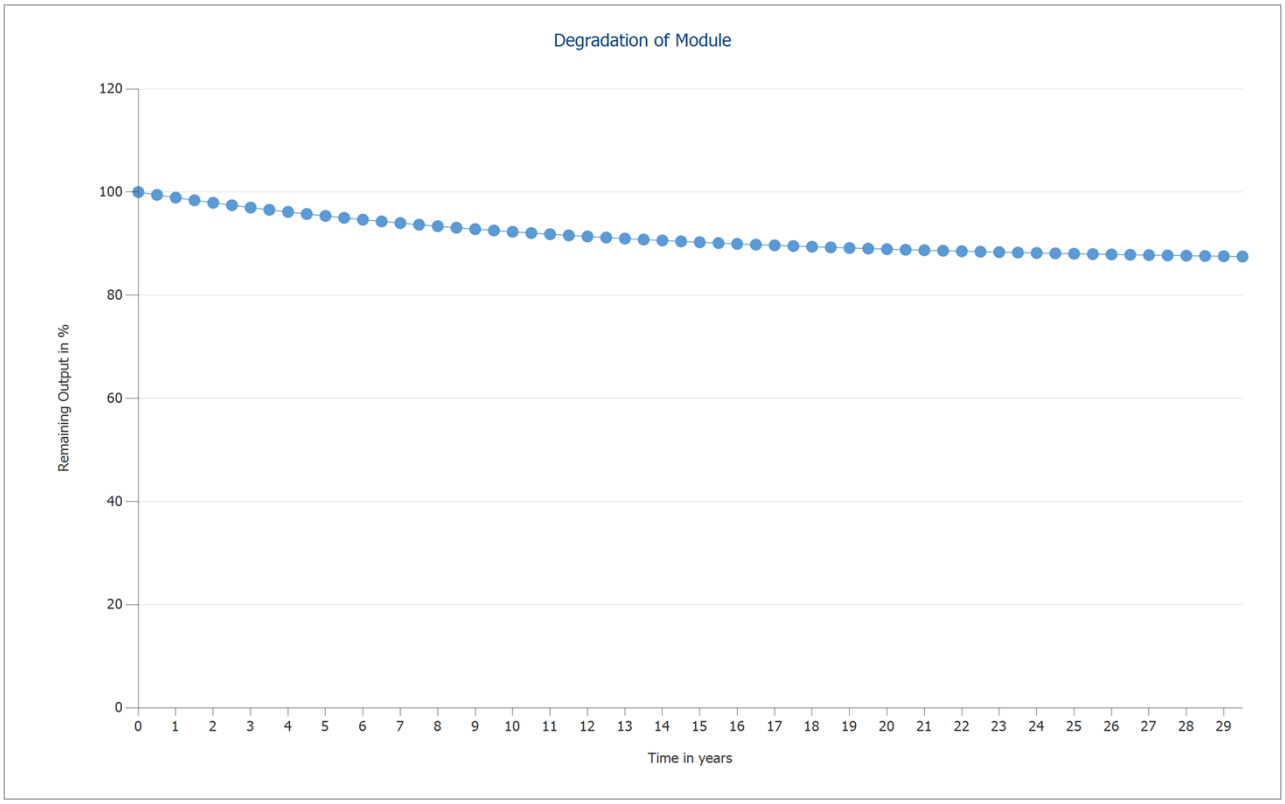


Figure: Degradation of Module, 1. Module Area - Building 01-Module Area Southeast

2. Module Area - Building 01-Module Area Northwest

PV Generator, 2. Module Area - Building 01-Module Area Northwest

Name	Building 01-Module Area Northwest
PV Modules	133 x TSM-425-DE09R.08 VERTEX S (v1)
Manufacturer	Trina Solar
Inclination	10 °
Orientation	Northwest 309 °
Installation Type	Mounted - Roof
PV Generator Surface	265.7 m²

Figure: 2. Module Area - Building 01-Module Area Northwest

Degradation of Module, 2. Module Area - Building 01-Module Area Northwest

Characteristic curve	Exponential
Remaining power (power output) after 1 year	99 %
Remaining power (power output) after 30 years	87.4 %

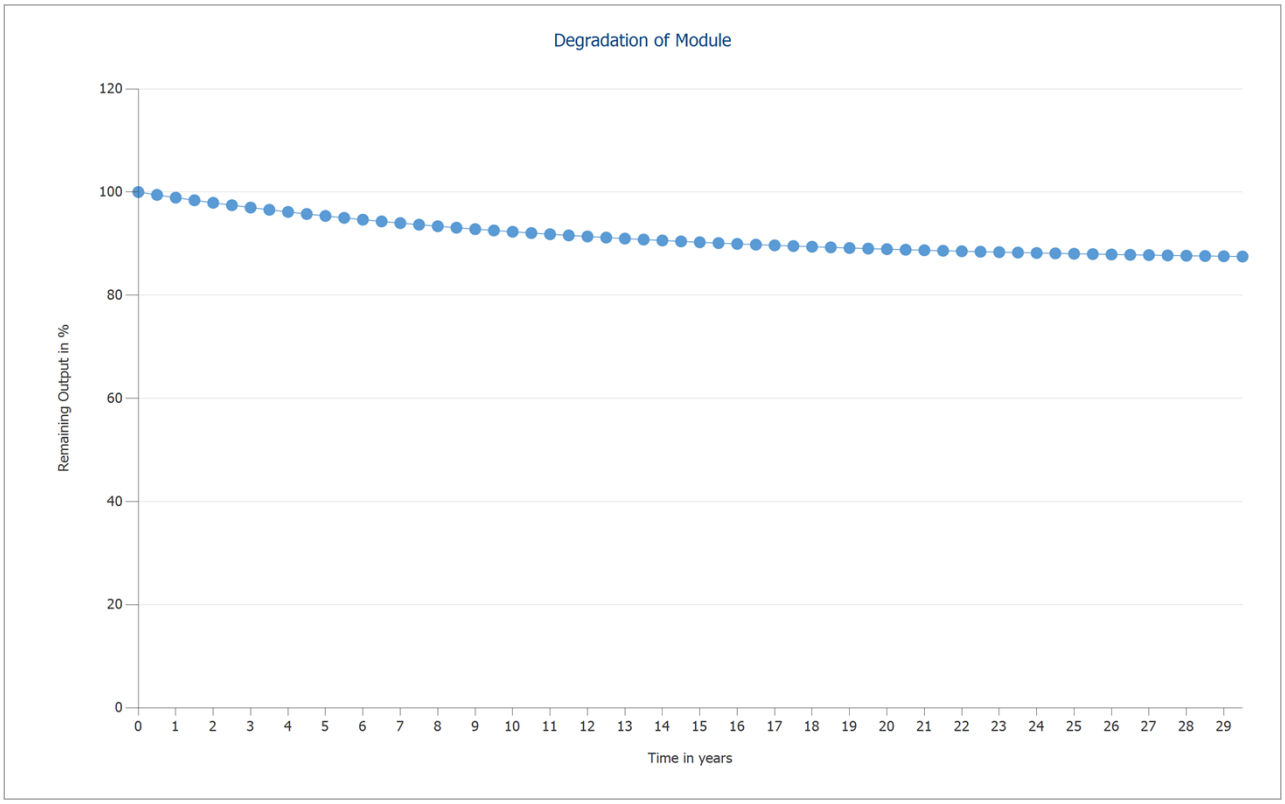


Figure: Degradation of Module, 2. Module Area - Building 01-Module Area Northwest

3. Module Area - Building 01-Module Area Southeast

PV Generator, 3. Module Area - Building 01-Module Area Southeast

Name	Building 01-Module Area Southeast
PV Modules	133 x TSM-425-DE09R.08 VERTEX S (v1)
Manufacturer	Trina Solar
Inclination	10 °
Orientation	Southeast 129 °
Installation Type	Mounted - Roof
PV Generator Surface	265.7 m²

Figure: 3. Module Area - Building 01-Module Area Southeast

Degradation of Module, 3. Module Area - Building 01-Module Area Southeast

Characteristic curve	Exponential
Remaining power (power output) after 1 year	99 %
Remaining power (power output) after 30 years	87.4 %

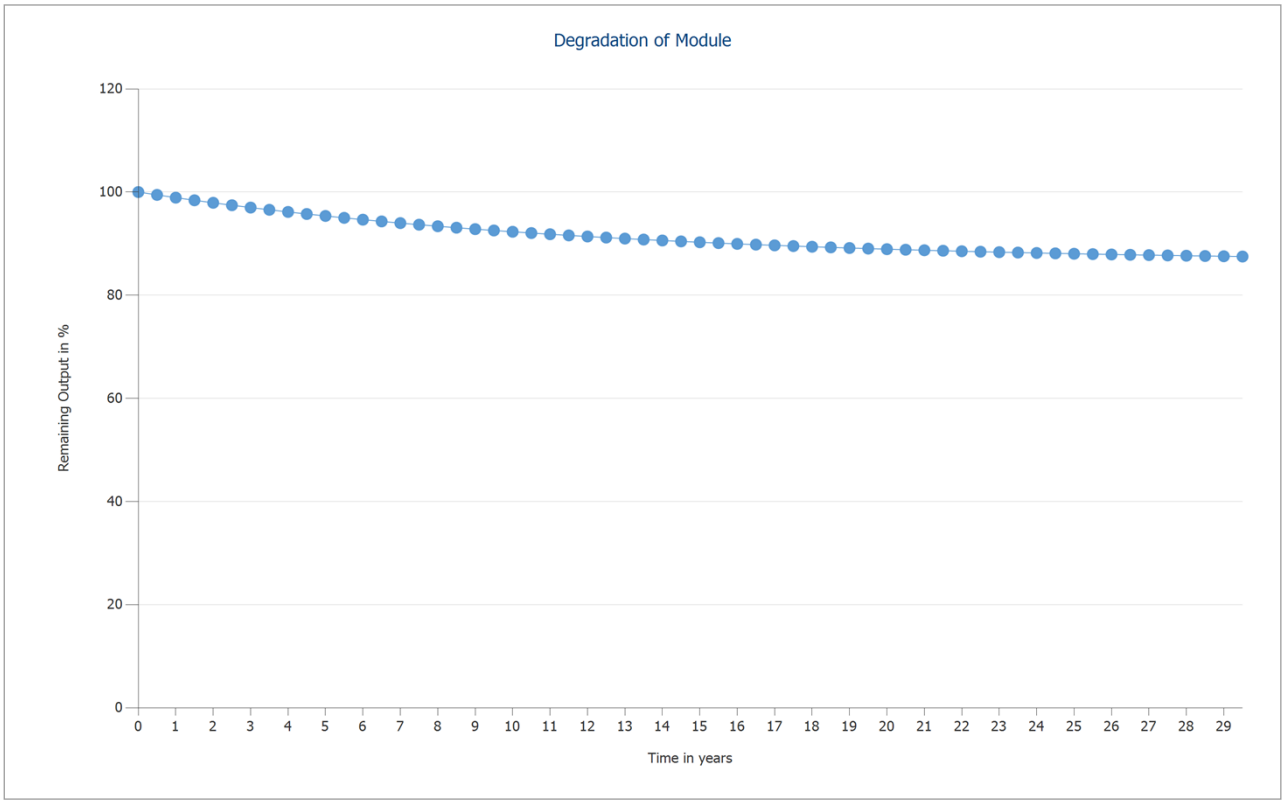


Figure: Degradation of Module, 3. Module Area - Building 01-Module Area Southeast

4. Module Area - Building 01-Module Area Northwest

PV Generator, 4. Module Area - Building 01-Module Area Northwest

Name	Building 01-Module Area Northwest	
PV Modules	133 x TSM-425-DE09R.08 VERTEX S (v1)	
Manufacturer	Trina Solar	
Inclination	10	°
Orientation	Northwest 309	°
Installation Type	Mounted - Roof	
PV Generator Surface	265.7	m²

Figure: 4. Module Area - Building 01-Module Area Northwest

Degradation of Module, 4. Module Area - Building 01-Module Area Northwest

Characteristic curve	Exponential
Remaining power (power output) after 1 year	99 %
Remaining power (power output) after 30 years	87.4 %

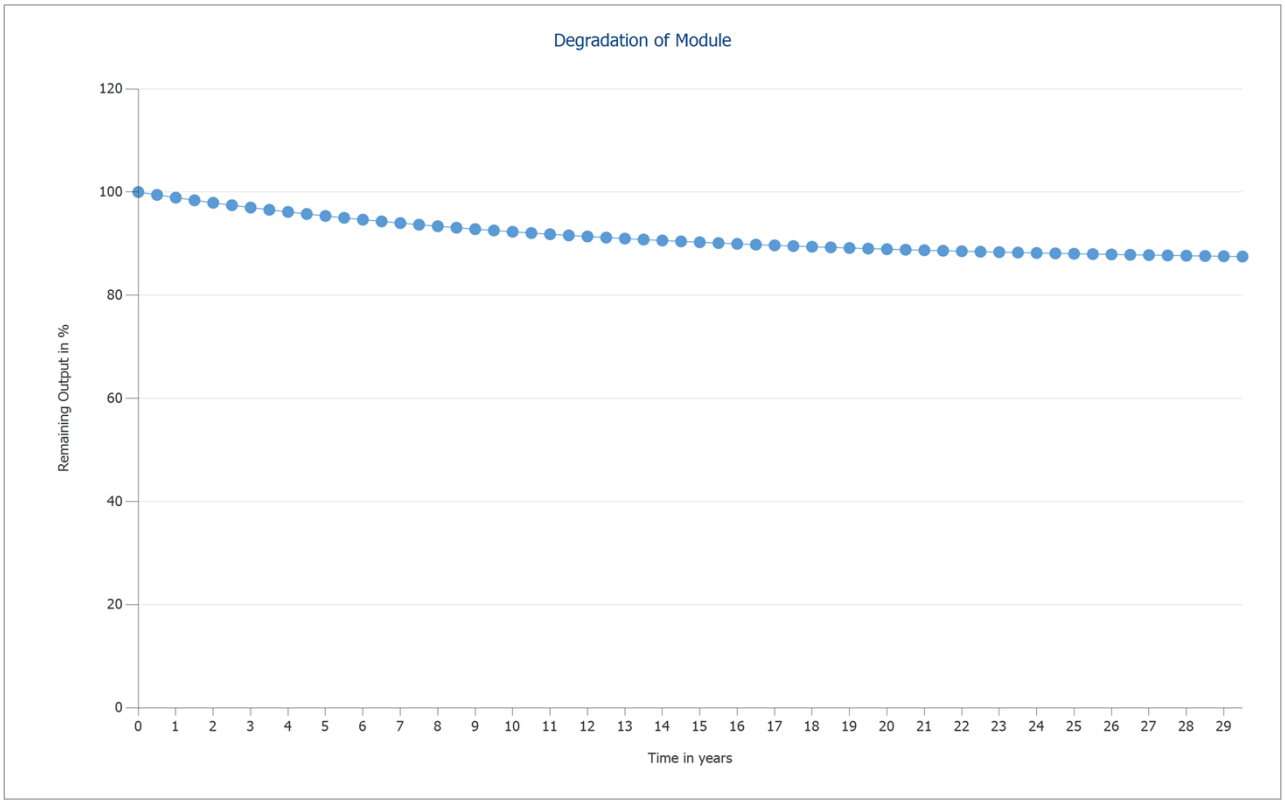


Figure: Degradation of Module, 4. Module Area - Building 01-Module Area Northwest

Horizon Line, 3D Design

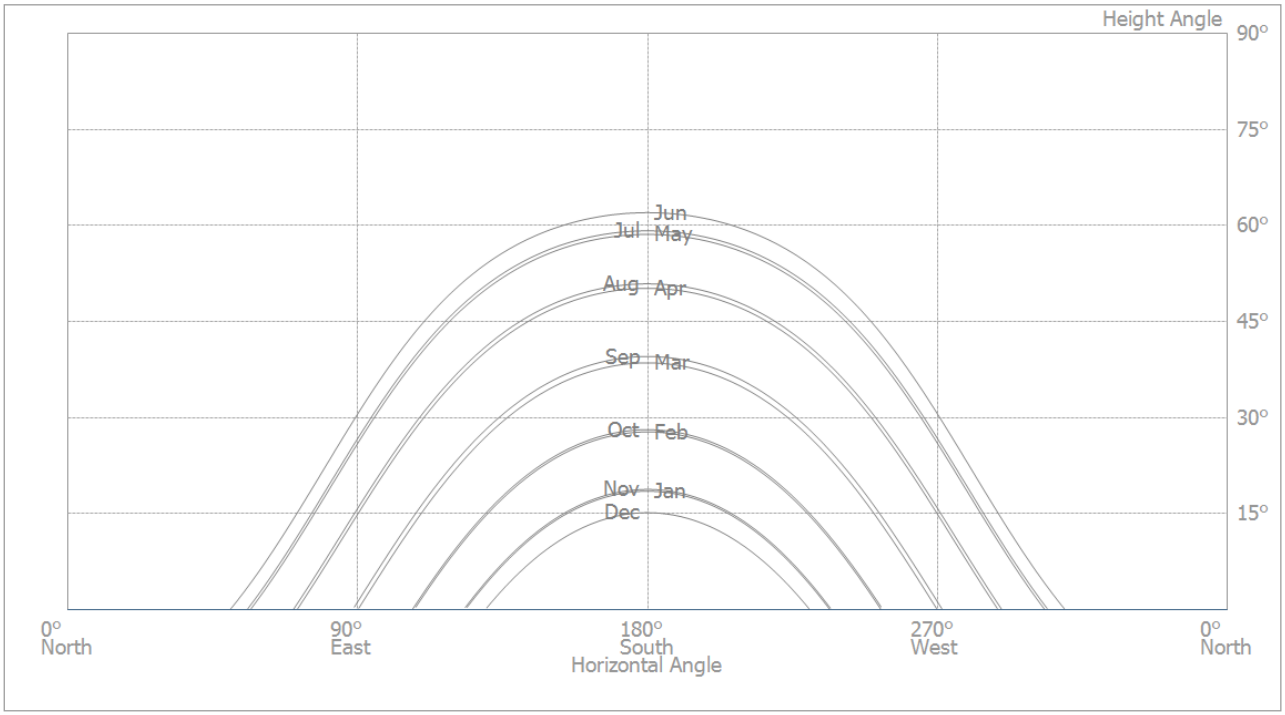


Figure: Horizon (3D Design)

Inverter configuration

Configuration 1

Module Areas	Building 01-Module Area Southeast + Building 01-Module Area Northwest
Inverter 1	
Model	Solis-100K-5G-PRO (v1)
Manufacturer	Ginlong (Solis)
Quantity	1
Sizing Factor	113.1 %
Configuration	MPP 1: 2 x 19
	MPP 2: 2 x 19
	MPP 3: 2 x 19
	MPP 4: 1 x 19
	MPP 5: 2 x 19
	MPP 6: 2 x 19
	MPP 7: 2 x 19
	MPP 8: 1 x 19

Configuration 2

Module Areas	Building 01-Module Area Southeast + Building 01-Module Area Northwest
Inverter 1	
Model	Solis-100K-5G-PRO (v1)
Manufacturer	Ginlong (Solis)
Quantity	1
Sizing Factor	113.1 %
Configuration	MPP 1: 2 x 19
	MPP 2: 2 x 19
	MPP 3: 2 x 19
	MPP 4: 1 x 19
	MPP 5: 2 x 19
	MPP 6: 2 x 19
	MPP 7: 2 x 19
	MPP 8: 1 x 19

AC Mains

AC Mains

Number of Phases	3
Mains voltage between phase and neutral	400 V
Displacement Power Factor (cos phi)	+/- 1

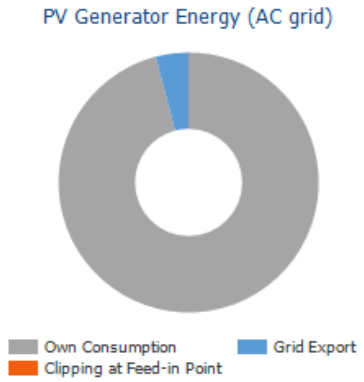
Project Designer: James Burke **Client:** Sainsbury's

Simulation Results

Results Total System

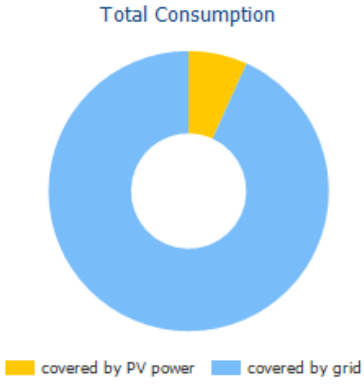
PV System

PV Generator Output	226.10	kWp
Spec. Annual Yield	867.87	kWh/kWp
Performance Ratio (PR)	87.45	%
Yield Reduction due to Shading	6.7	%
PV Generator Energy (AC grid)	196,240	kWh/Year
Own Consumption	188,209	kWh/Year
Clipping at Feed-in Point	0	kWh/Year
Grid Export	8,031	kWh/Year
Own Power Consumption	95.9	%
CO_2 Emissions avoided	44,151	kg / year



Appliances

Appliances	2,777,707	kWh/Year
Standby Consumption (Inverter)	14	kWh/Year
Total Consumption	2,777,721	kWh/Year
covered by PV power	188,209	kWh/Year
covered by grid	2,589,512	kWh/Year
Solar Fraction	6.8	%



Level of Self-sufficiency

Total Consumption	2,777,721	kWh/Year
covered by grid	2,589,512	kWh/Year
Level of Self-sufficiency	6.8	%

Sainsbury's - St Clares

Project Designer: James Burke **Client:** Sainsbury's

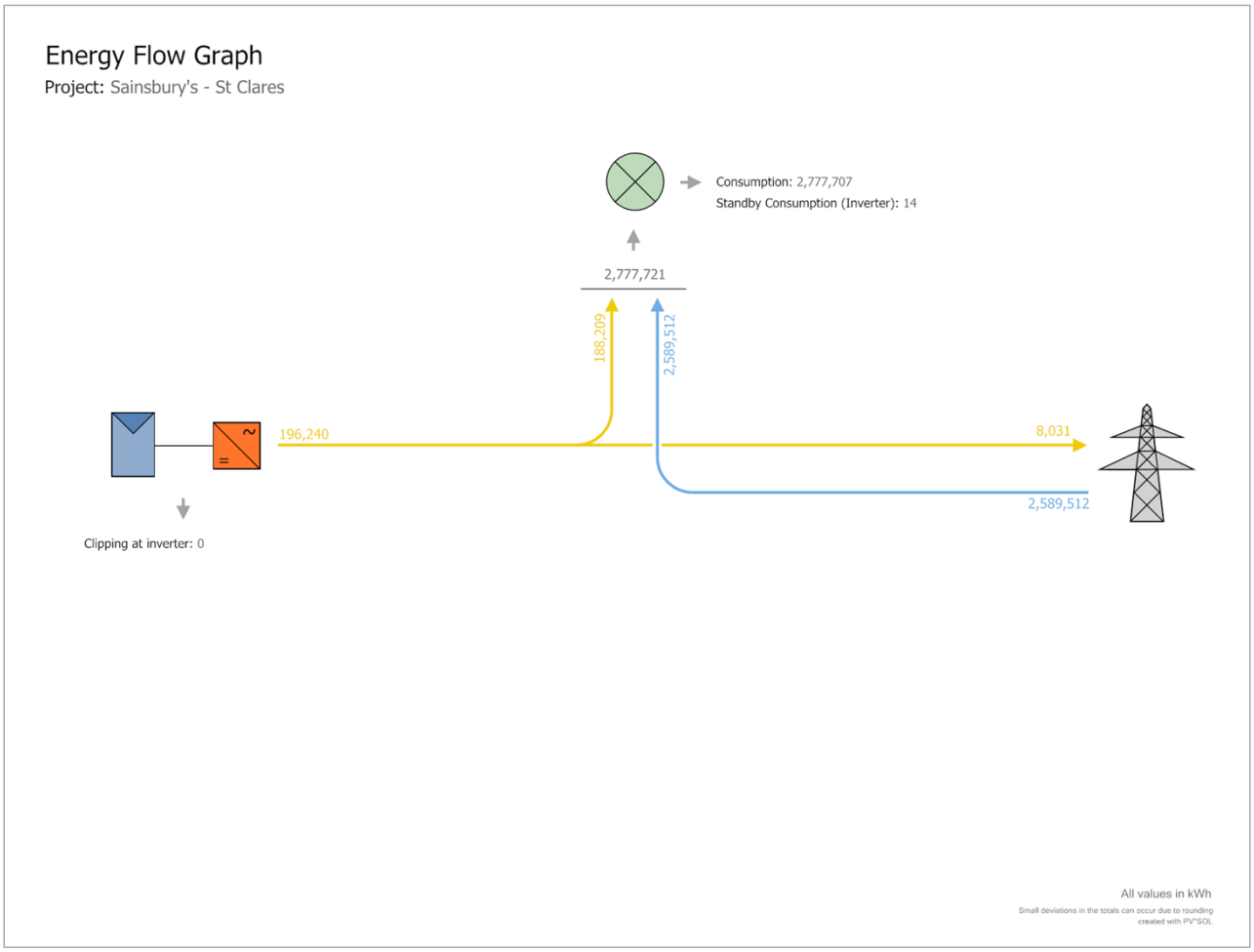


Figure: Energy flow

Project Designer: James Burke **Client:** Sainsbury's

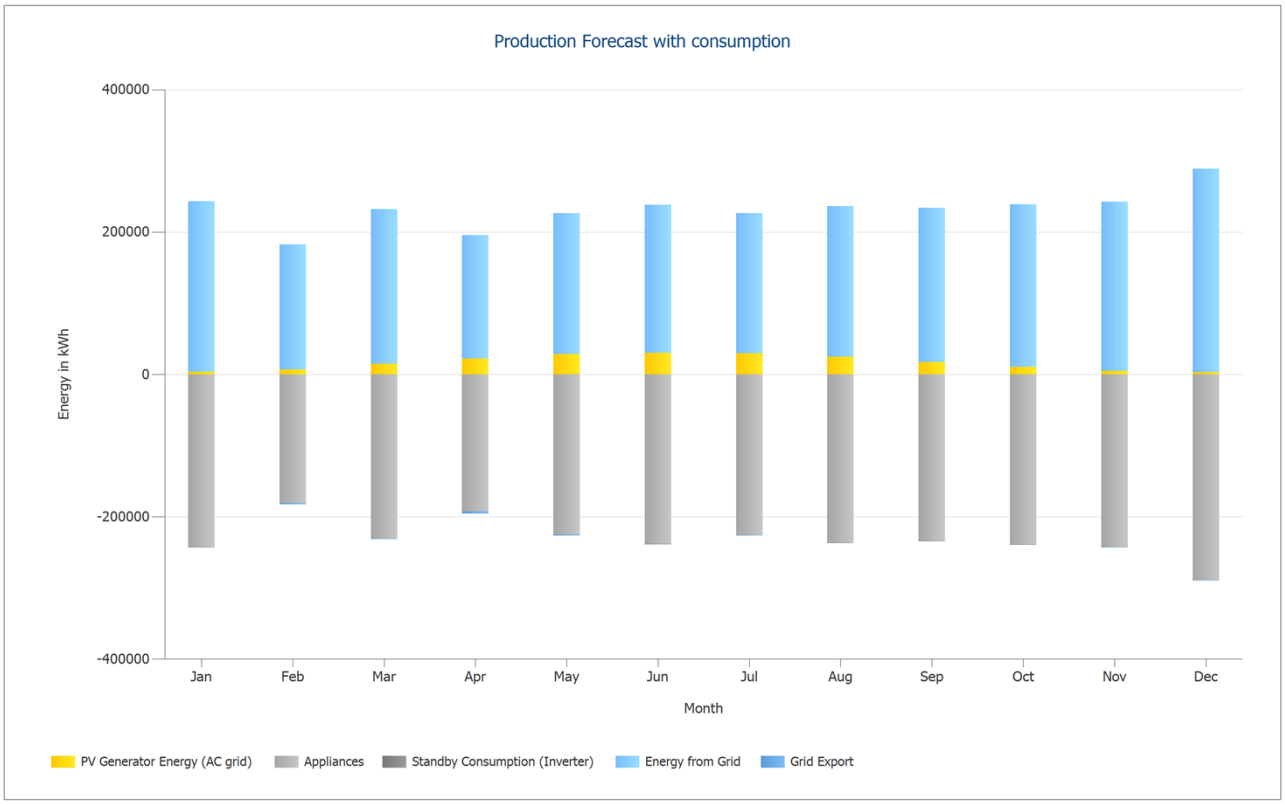


Figure: Production Forecast with consumption

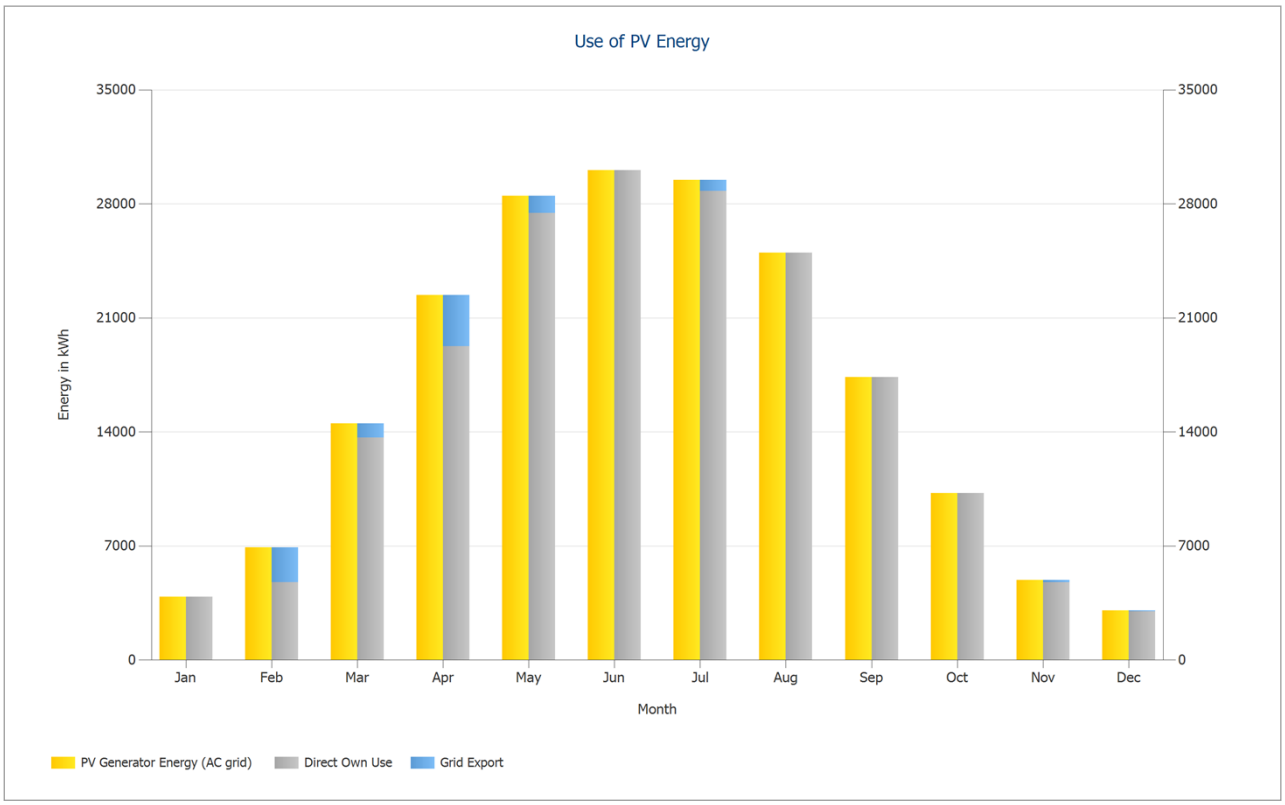


Figure: Use of PV Energy

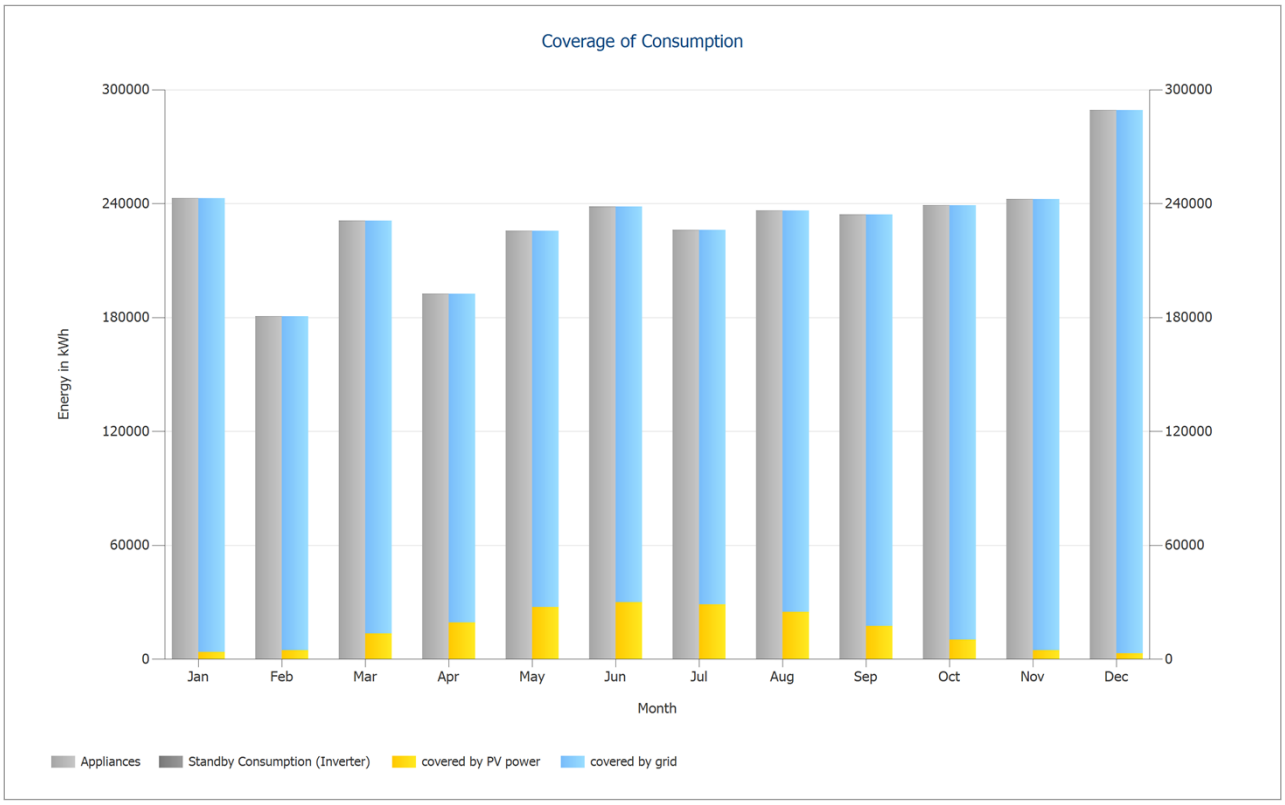


Figure: Coverage of Consumption

Results per Module Area

Building 01-Module Area Southeast

PV Generator Output	56.52	kWp
PV Generator Surface	265.75	m²
Global Radiation at the Module	1038.86	kWh/m²
Global Radiation on Module without reflection	1041.35	kWh/m²
Performance Ratio (PR)	87.68	%
PV Generator Energy (AC grid)	51660.02	kWh/Year
Spec. Annual Yield	913.93	kWh/kWp

Building 01-Module Area Northwest

PV Generator Output	56.52	kWp
PV Generator Surface	265.75	m²
Global Radiation at the Module	941.95	kWh/m²
Global Radiation on Module without reflection	944.66	kWh/m²
Performance Ratio (PR)	88.43	%
PV Generator Energy (AC grid)	47262.60	kWh/Year
Spec. Annual Yield	836.14	kWh/kWp

Building 01-Module Area Southeast

PV Generator Output	56.52	kWp
PV Generator Surface	265.75	m²
Global Radiation at the Module	1038.86	kWh/m²
Global Radiation on Module without reflection	1041.35	kWh/m²
Performance Ratio (PR)	86.90	%
PV Generator Energy (AC grid)	51201.65	kWh/Year
Spec. Annual Yield	905.82	kWh/kWp

Building 01-Module Area Northwest

PV Generator Output	56.52	kWp
PV Generator Surface	265.75	m²
Global Radiation at the Module	936.20	kWh/m²
Global Radiation on Module without reflection	938.90	kWh/m²
Performance Ratio (PR)	86.82	%
PV Generator Energy (AC grid)	46116.10	kWh/Year
Spec. Annual Yield	815.85	kWh/kWp

Plans and parts list

Circuit Diagram

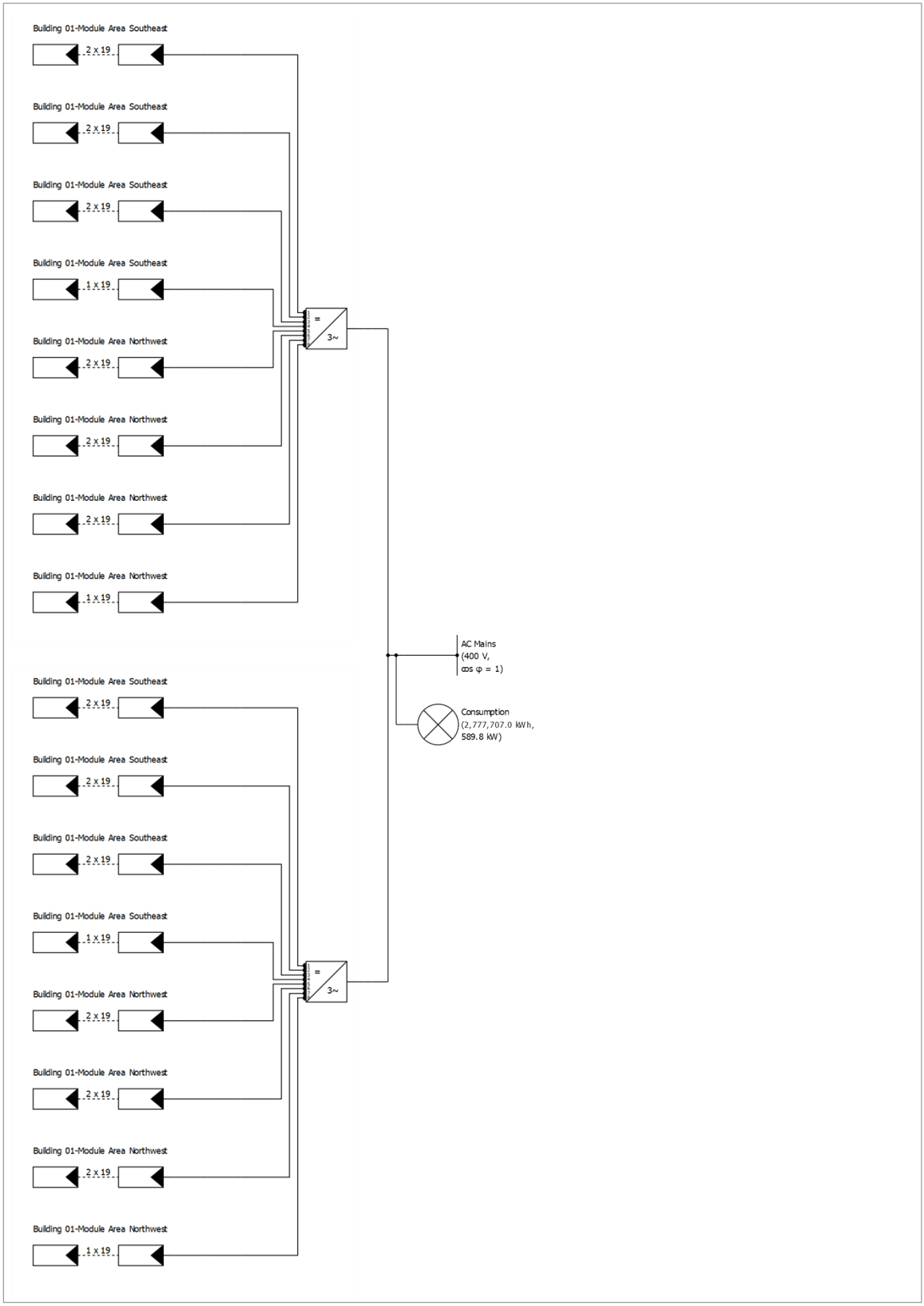


Figure: Circuit Diagram

Overview plan

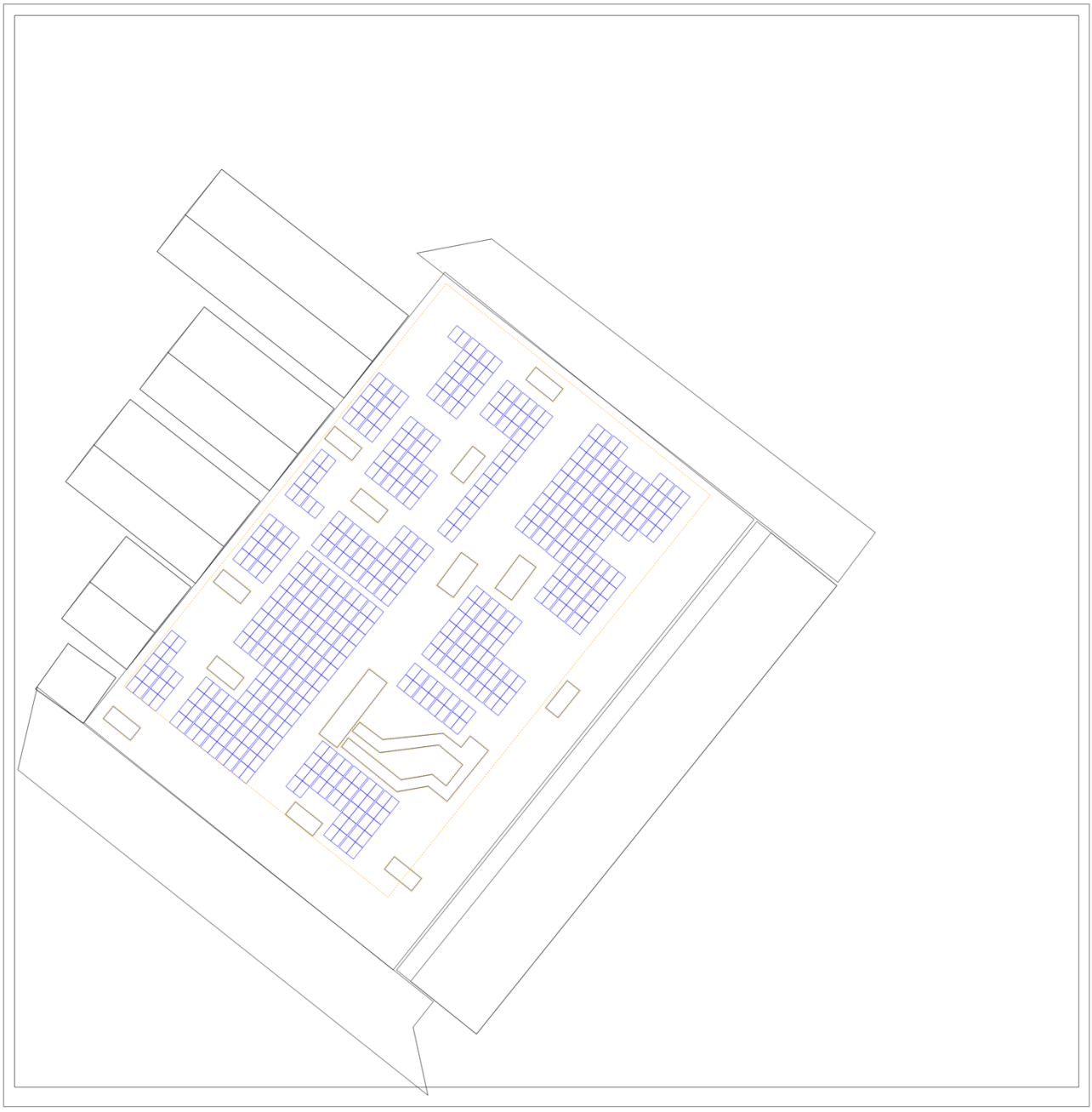


Figure: Overview plan

Project Designer: James Burke **Client:** Sainsbury's

Dimensioning Plan

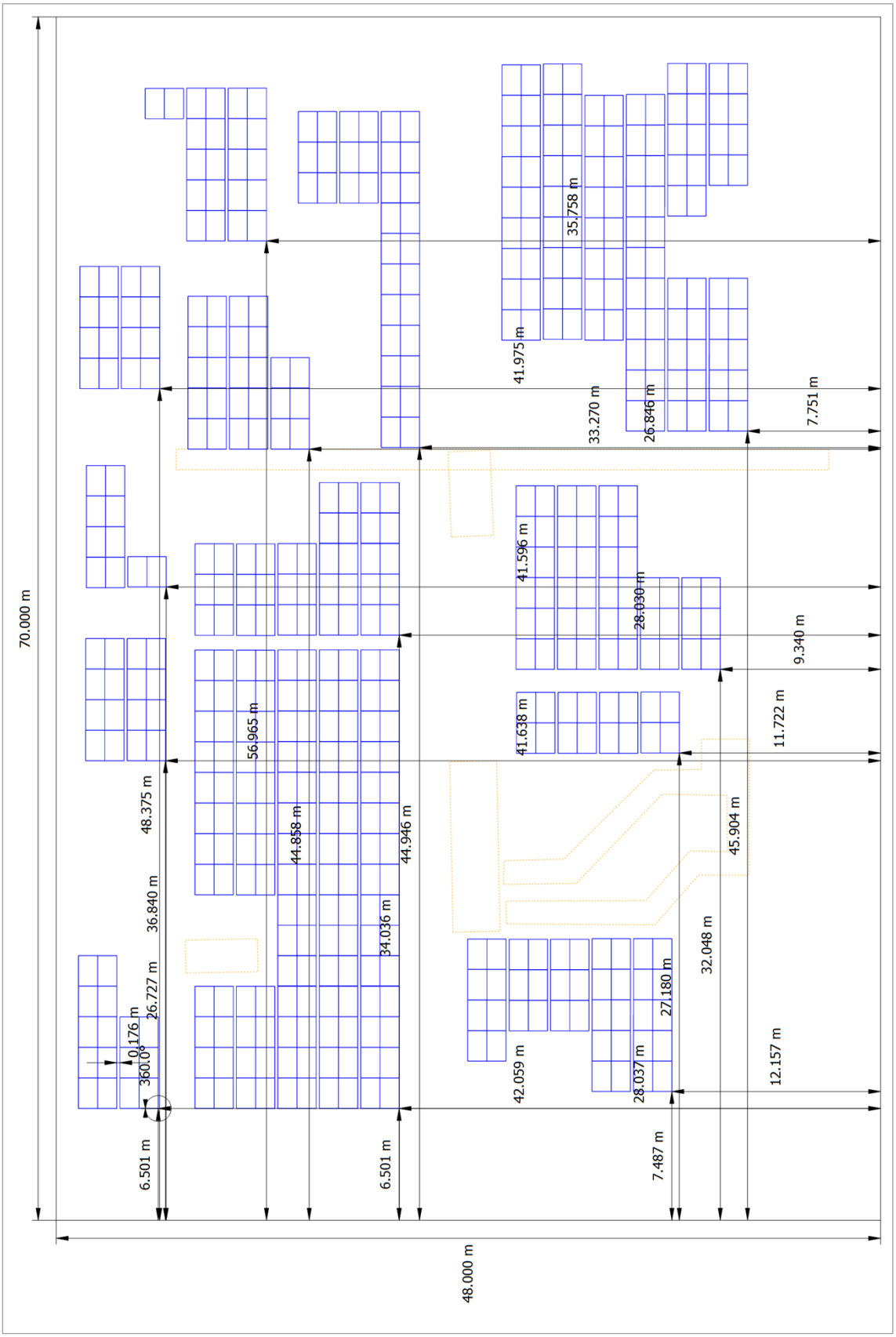


Figure: Building 01 - Roof Area Southeast

Project Designer: James Burke **Client:** Sainsbury's

String Plan

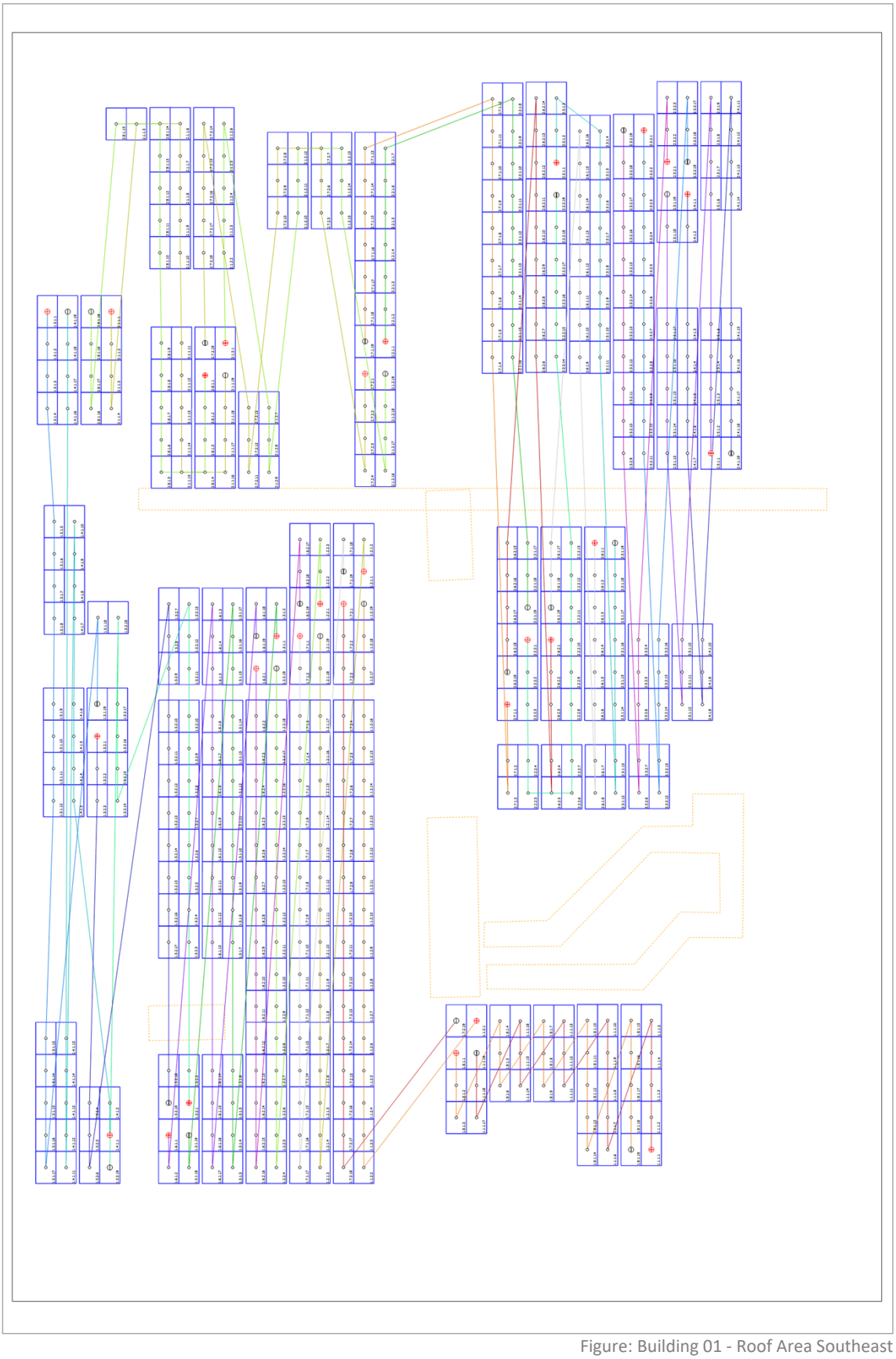


Figure: Building 01 - Roof Area Southeast

Parts list

Parts list

#	Type	Item number	Manufacturer	Name	Quantity	Unit
1	PV Module		Trina Solar	TSM-425-DE09R.08 VERTEX S	532	Piece
2	Inverter		Ginlong (Solis)	Solis-100K-5G-PRO	2	Piece