Case Study 7 - Fixed Tilt, Germany

Case Study 7 - Fixed Tilt, Germany, Lindbergstrabe 6, 85399 hallbergmoos, Germany

Report

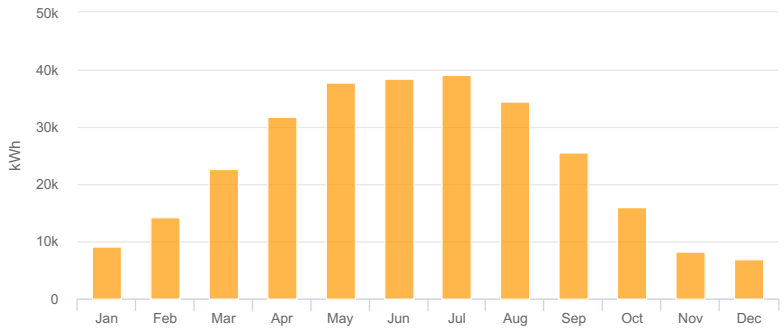
Project Name	Case Study 7 - Fixed Tilt, Germany
Project Address	Lindbergstrabe 6, 85399 hallbergmoos, Germany
Prepared By	Bhanu Swaroop Gaddam gaddambhanu9@gmail.com

System Metrics

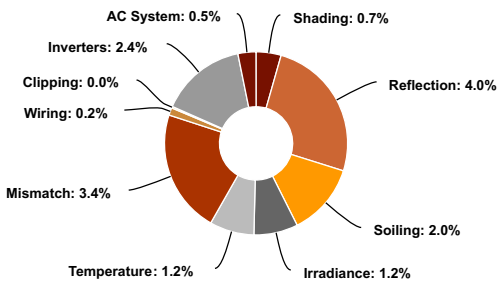
Design	Case Study 7 - Fixed Tilt, Germany
Module DC Nameplate	262.1 kW
Inverter AC Nameplate	224.0 kW Load Ratio: 1.17
Annual Production	284.3 MWh
Performance Ratio	85.3%
kWh/kWp	1,085.0
Weather Dataset	TMY, 10km Grid, meteonorm (meteonorm)
Simulator Version	77eaf2cdb5-02f2a7f506-20068b956b-d70d5f9ff0

Project Location

Monthly Production



Sources of System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,182.3	
	POA Irradiance	1,271.4	7.5%
	Shaded Irradiance	1,262.6	-0.7%
	Irradiance after Reflection	1,212.2	-4.0%
	Irradiance after Soiling	1,188.0	-2.0%
	Total Collector Irradiance	**1,188.0**	**0.0%**
Energy (kWh)	Nameplate	311,468.8	
	Output at Irradiance Levels	307,660.8	-1.2%
	Output at Cell Temperature Derate	303,862.1	-1.2%
	Output After Mismatch	293,475.4	-3.4%
	Optimal DC Output	292,872.9	-0.2%
	Constrained DC Output	292,745.9	0.0%
	Inverter Output	285,758.9	-2.4%
	Energy to Grid	**284,330.1**	**-0.5%**
Temperature Metrics			
	Avg. Operating Ambient Temp		12.1 °C
	Avg. Operating Cell Temp		18.6 °C
Simulation Metrics			
	Operating Hours		4606
	Solved Hours		4606

Condition Set

Description	Condition Set 1
Weather Dataset	TMY, 10km Grid, meteonorm (meteonorm)
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

Soiling (%)

J	F	M	A	M	J	J	A	S	O	N	D
2	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
TSM-PD14 320 (May16) (Trina Solar)	Folsom Labs	Spec Sheet Characterization, PAN
CS3L-350P (1000V) (Canadian Solar)	Folsom Labs	Spec Sheet Characterization, PAN

Component Characterizations

Device	Uploaded By	Characterization

Components

Component	Name	Count
Inverters	Eco 24.0-3-S (Fronius)	1 (24.0 kW)
Inverters	ECO 25.0-3-S (Fronius)	8 (200.0 kW)
Strings	10 AWG (Copper)	43 (3,552.4 ft)
Module	Trina Solar, TSM-PD14 320 (May16) (320W)	750 (240.0 kW)
Module	Canadian Solar, CS3L-350P (1000V) (350W)	63 (22.1 kW)

Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	17-19	Along Racking
Wiring Zone 2	-	18-22	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Fixed Tilt	Landscape (Horizontal)	10°	205.77843°	2.6 ft	1x1	772	751	240.3 kW
Field Segment 2	Fixed Tilt	Landscape (Horizontal)	10°	205.87239°	2.6 ft	1x1	65	65	22.8 kW

Detailed Layout