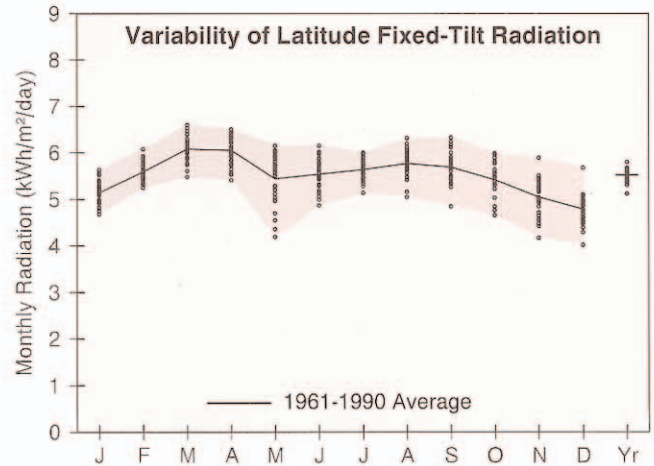


San Juan, PR

WBAN NO. 11641

LATITUDE: 18.43° N
 LONGITUDE: 66.00° W
 ELEVATION: 19 meters
 MEAN PRESSURE: 1014 millibars

STATION TYPE: Primary



Solar Radiation for Flat-Plate Collectors Facing South at a Fixed Tilt (kWh/m²/day), Uncertainty ±9%

Tilt (°)		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
0	Average	4.3	4.9	5.7	6.1	5.8	6.1	6.1	6.0	5.5	4.9	4.3	4.0	5.3
	Min/Max	4.0/4.6	4.7/5.3	5.2/6.2	5.4/6.5	4.4/6.6	5.3/6.8	5.5/6.5	5.2/6.5	4.8/6.1	4.3/5.4	3.7/4.9	3.4/4.5	4.9/5.5
Latitude -15	Average	4.5	5.1	5.8	6.1	5.7	6.0	6.0	6.0	5.6	5.0	4.5	4.1	5.4
	Min/Max	4.1/4.8	4.8/5.5	5.3/6.3	5.5/6.6	4.4/6.5	5.2/6.7	5.5/6.4	5.2/6.5	4.8/6.2	4.4/5.5	3.8/5.1	3.5/4.8	5.0/5.6
Latitude	Average	5.1	5.6	6.1	6.1	5.4	5.5	5.6	5.8	5.7	5.4	5.1	4.8	5.5
	Min/Max	4.7/5.6	5.3/6.1	5.5/6.6	5.4/6.5	4.2/6.2	4.9/6.2	5.1/6.0	5.1/6.3	4.8/6.3	4.7/6.0	4.2/5.9	4.0/5.7	5.1/5.8
Latitude +15	Average	5.5	5.8	6.0	5.7	4.9	4.8	5.0	5.3	5.5	5.5	5.4	5.2	5.4
	Min/Max	5.0/6.1	5.4/6.3	5.4/6.5	5.1/6.1	3.8/5.5	4.3/5.3	4.5/5.3	4.6/5.8	4.7/6.1	4.7/6.1	4.3/6.3	4.3/6.3	5.0/5.7
90	Average	4.2	3.9	3.1	2.0	1.5	1.5	1.5	1.7	2.5	3.3	3.9	4.1	2.8
	Min/Max	3.8/4.8	3.6/4.2	2.8/3.3	1.9/2.1	1.4/1.6	1.4/1.5	1.4/1.5	1.6/1.7	2.2/2.7	2.8/3.7	3.1/4.7	3.3/5.1	2.7/3.0

Solar Radiation for 1-Axis Tracking Flat-Plate Collectors with a North-South Axis (kWh/m²/day), Uncertainty ±9%

Axis Tilt (°)		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
0	Average	5.6	6.4	7.4	7.8	7.2	7.6	7.6	7.5	7.0	6.3	5.5	5.1	6.8
	Min/Max	5.1/6.3	5.8/7.0	6.4/8.2	6.5/8.7	5.0/8.5	6.3/8.9	6.8/8.5	6.4/8.6	5.8/8.2	5.2/7.2	4.4/6.6	4.2/6.4	6.1/7.2
Latitude -15	Average	5.8	6.5	7.5	7.8	7.2	7.5	7.6	7.5	7.0	6.4	5.7	5.2	6.8
	Min/Max	5.2/6.5	5.9/7.2	6.5/8.3	6.5/8.7	5.0/8.4	6.3/8.9	6.7/8.5	6.4/8.6	5.8/8.2	5.3/7.3	4.5/6.8	4.3/6.5	6.1/7.3
Latitude	Average	6.3	6.9	7.7	7.8	6.9	7.2	7.3	7.4	7.1	6.7	6.1	5.7	6.9
	Min/Max	5.6/7.1	6.3/7.6	6.7/8.5	6.4/8.6	4.9/8.2	6.0/8.5	6.5/8.1	6.2/8.4	5.8/8.4	5.5/7.6	4.8/7.3	4.6/7.2	6.2/7.4
Latitude +15	Average	6.6	7.1	7.6	7.5	6.5	6.7	6.8	7.0	7.0	6.7	6.3	6.0	6.8
	Min/Max	5.8/7.4	6.4/7.8	6.6/8.4	6.2/8.3	4.6/7.7	5.6/7.9	6.0/7.6	5.9/8.0	5.7/8.2	5.5/7.7	4.9/7.7	4.8/7.7	6.2/7.4

Solar Radiation for 2-Axis Tracking Flat-Plate Collectors (kWh/m²/day), Uncertainty ±9%

Tracker		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
2-Axis	Average	6.6	7.1	7.7	7.9	7.2	7.7	7.7	7.6	7.1	6.7	6.4	6.1	7.2
	Min/Max	5.9/7.5	6.4/7.8	6.7/8.5	6.5/8.8	5.1/8.5	6.4/9.1	6.8/8.6	6.4/8.6	5.9/8.4	5.5/7.7	5.0/7.7	4.9/7.8	6.5/7.7

Direct Beam Solar Radiation for Concentrating Collectors (kWh/m²/day), Uncertainty ±8%

Tracker		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
1-Axis, E-W Horiz Axis	Average	3.5	3.5	3.7	3.7	3.2	3.6	3.6	3.5	3.2	3.1	3.2	3.2	3.4
	Min/Max	2.8/4.3	2.9/4.2	2.9/4.3	2.6/4.5	1.6/4.3	2.6/4.8	2.9/4.3	2.5/4.4	2.4/4.0	2.2/4.1	2.0/4.5	2.2/4.8	2.9/4.0
1-Axis, N-S Horiz Axis	Average	3.5	4.0	4.8	4.9	4.1	4.5	4.6	4.6	4.2	3.7	3.3	3.0	4.1
	Min/Max	2.8/4.3	3.2/4.8	3.6/5.6	3.4/6.1	2.1/5.5	3.3/6.2	3.7/5.6	3.3/5.9	3.1/5.4	2.6/4.9	2.0/4.6	2.1/4.7	3.5/4.8
1-Axis, N-S Tilt=Latitude	Average	4.0	4.4	5.0	4.9	4.0	4.3	4.4	4.5	4.3	4.0	3.7	3.5	4.2
	Min/Max	3.2/4.9	3.5/5.2	3.8/5.8	3.3/6.0	2.0/5.3	3.1/5.8	3.5/5.3	3.2/5.7	3.2/5.6	2.8/5.3	2.3/5.2	2.5/5.4	3.6/5.0
2-Axis	Average	4.3	4.5	5.0	5.0	4.2	4.6	4.7	4.6	4.3	4.0	3.9	3.8	4.4
	Min/Max	3.4/5.3	3.6/5.4	3.8/5.8	3.4/6.1	2.1/5.6	3.3/6.3	3.7/5.7	3.3/5.9	3.2/5.6	2.8/5.3	2.5/5.5	2.7/5.9	3.7/5.2

Average Climatic Conditions

Element	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
Temperature (°C)	25.0	25.1	25.6	26.3	27.2	27.9	28.1	28.2	28.1	27.7	26.7	25.6	26.8
Daily Minimum Temp	21.6	21.4	22.0	22.7	23.6	24.5	24.9	24.8	24.6	24.2	23.3	22.4	23.3
Daily Maximum Temp	28.4	28.7	29.1	29.9	30.7	31.4	31.4	31.5	31.6	31.3	29.9	28.8	30.2
Record Minimum Temp	16.1	16.7	15.6	17.8	18.9	20.6	20.6	21.1	20.6	19.4	18.9	17.2	15.6
Record Maximum Temp	33.3	35.6	35.6	36.1	35.6	36.1	35.0	36.1	36.1	36.7	35.6	34.4	36.7
HDD, Base 18.3°C	0	0	0	0	0	0	0	0	0	0	0	0	0
CDD, Base 18.3°C	207	188	224	240	274	288	303	305	292	291	250	226	3088
Relative Humidity (%)	74	72	71	71	75	76	76	76	76	77	76	75	75
Wind Speed (m/s)	3.5	3.8	4.0	3.8	3.5	3.8	4.1	3.7	3.2	2.9	3.2	3.5	3.6