ForgeSolar

2945 - Tararua

Railway with existing and 3m mitigation planting

Client: Solar Bay

Created Aug 15, 2023
Updated Aug 15, 2023
Time-step 1 minute
Timezone offset UTC12
Minimum sun altitude 0.0 deg
Site ID 97631.12086

Project type Advanced
Project status: active
Category 10 MW to 100 MW

Misc. Analysis Settings

DNI: **varies (1,000.0 W/m^2 peak)**
Ocular transmission coefficient: **0.5**
Pupil diameter: **0.002 m**
Eye focal length: **0.017 m**
Sun subtended angle: **9.3 mrad**

PV Analysis Methodology: **Version 2**
Enhanced subtended angle calculation: **On**

Summary of Results No glare predicted!

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
SAT Array East	SA tracking	SA tracking	0	0	-
SAT Array West	SA tracking	SA tracking	0	0	-

Component Data

PV Array(s)

Total PV footprint area: 829,652 m^2

Name: SAT Array East
Footprint area: 375,139 m^2
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0 deg
Maximum tracking angle: 55.0 deg
Resting angle: 0.0 deg
Ground Coverage Ratio: 0.404

Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	m	m	m
1	-40.523131	175.748672	157.00	2.40	159.40
2	-40.521914	175.749605	154.00	2.40	156.40
3	-40.521488	175.750568	153.00	2.40	155.40
4	-40.521159	175.750142	152.00	2.40	154.40
5	-40.520645	175.750533	151.00	2.40	153.40
6	-40.519854	175.751129	150.00	2.40	152.40
7	-40.519198	175.751628	148.00	2.40	150.40

8	-40.518333	175.752266	147.00	2.40	149.40
9	-40.517389	175.753038	146.00	2.40	148.40
10	-40.517662	175.753580	146.00	2.40	148.40
11	-40.517964	175.754197	146.00	2.40	148.40
12	-40.518659	175.753564	147.00	2.40	149.40
13	-40.518953	175.754079	147.00	2.40	149.40
14	-40.519357	175.755013	148.00	2.40	150.40
15	-40.519055	175.755345	147.00	2.40	149.40
16	-40.518745	175.755627	147.00	2.40	149.40
17	-40.519126	175.756308	147.00	2.40	149.40
18	-40.519540	175.757072	147.60	2.40	150.00
19	-40.520034	175.756627	148.00	2.40	150.40
20	-40.520658	175.756053	149.00	2.40	151.40
21	-40.521188	175.755549	150.00	2.40	152.40
22	-40.521624	175.756439	150.00	2.40	152.40
23	-40.522146	175.757587	150.00	2.40	152.40
24	-40.523155	175.756874	151.00	2.40	153.40
25	-40.524022	175.756225	152.60	2.40	155.00
26	-40.524986	175.755533	153.80	2.40	156.20
27	-40.525995	175.754760	154.10	2.40	156.50
28	-40.525482	175.753671	155.00	2.40	157.40
29	-40.524776	175.752164	155.90	2.40	158.30
30	-40.524160	175.750855	156.00	2.40	158.40
31	-40.523685	175.749841	157.00	2.40	159.40

Name: SAT Array West
Footprint area: 454,514 m^2
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0 deg
Maximum tracking angle: 55.0 deg
Resting angle: 0.0 deg
Ground Coverage Ratio: 0.404

Rated power: -
Panel material: Smooth glass with AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 8.43 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	m	m	m
1	-40.521784	175.749185	154.00	2.40	156.40
2	-40.522361	175.748739	155.70	2.40	158.10
3	-40.523179	175.748136	157.20	2.40	159.60
4	-40.523727	175.747712	158.70	2.40	161.10
5	-40.524043	175.747488	159.00	2.40	161.40
6	-40.524343	175.747245	159.00	2.40	161.40
7	-40.524017	175.746564	160.00	2.40	162.40
8	-40.523723	175.745985	160.00	2.40	162.40
9	-40.523633	175.745840	160.00	2.40	162.40
10	-40.524241	175.745244	160.00	2.40	162.40
11	-40.524791	175.744735	161.00	2.40	163.40
12	-40.524985	175.745113	161.00	2.40	163.40
13	-40.525305	175.745778	160.00	2.40	162.40
14	-40.525560	175.746352	160.00	2.40	162.40
15	-40.525996	175.746038	160.00	2.40	162.40
16	-40.526791	175.745443	160.00	2.40	162.40
17	-40.527483	175.744912	161.00	2.40	163.40
18	-40.528100	175.744451	161.00	2.40	163.40
19	-40.529542	175.743423	163.00	2.40	165.40
20	-40.529164	175.742624	163.00	2.40	165.40
21	-40.528802	175.741902	163.00	2.40	165.40
22	-40.528441	175.741127	164.00	2.40	166.40
23	-40.527980	175.740135	163.00	2.40	165.40
24	-40.527487	175.739124	163.00	2.40	165.40
25	-40.527095	175.738265	162.00	2.40	164.40
26	-40.526687	175.737420	161.00	2.40	163.40
27	-40.525436	175.738721	160.00	2.40	162.40
28	-40.524746	175.739419	160.00	2.40	162.40
29	-40.524017	175.740223	160.00	2.40	162.40
30	-40.523405	175.740835	159.00	2.40	161.40
31	-40.522728	175.741511	157.00	2.40	159.40
32	-40.522125	175.742101	157.00	2.40	159.40
33	-40.521749	175.742519	157.00	2.40	159.40
34	-40.521668	175.743421	158.70	2.40	161.10
35	-40.521439	175.744054	157.00	2.40	159.40
36	-40.521439	175.744762	156.00	2.40	158.40
37	-40.521260	175.745631	155.00	2.40	157.40
38	-40.520942	175.746103	154.00	2.40	156.40

39	-40.520449	175.746763	152.40	2.40	154.80
40	-40.520864	175.747658	153.00	2.40	155.40
41	-40.521350	175.748667	153.60	2.40	156.00

Route Receptor(s)

Name: Railway
Route type Two-way
View angle: 50.0 deg

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	m	m	m
1	-40.509494	175.747086	146.99	3.00	149.99
2	-40.510587	175.746700	149.54	3.00	152.54
3	-40.513409	175.746829	148.02	3.00	151.02
4	-40.515269	175.746872	149.00	3.00	152.00
5	-40.517161	175.745906	148.00	3.00	151.00
6	-40.519119	175.744705	148.00	3.00	151.00
7	-40.521207	175.742537	155.00	3.00	158.00
8	-40.524322	175.739319	159.26	3.00	162.26
9	-40.527845	175.735607	164.00	3.00	167.00
10	-40.531188	175.732066	170.00	3.00	173.00
11	-40.533015	175.730242	171.00	3.00	174.00
12	-40.535331	175.727732	174.92	3.00	177.92

Obstruction Components

Name: Obstruction 1
Upper edge height: 3.0 m

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	m
1	-40.517741	175.752624	146.00
2	-40.517398	175.752889	146.00
3	-40.517431	175.752962	146.00
4	-40.517359	175.753021	146.00
5	-40.517651	175.753616	146.00
6	-40.517946	175.754212	146.00

Name: Obstruction 10
Upper edge height: 10.0 m

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	m
1	-40.517712	175.752594	146.00
2	-40.518510	175.751972	147.00
3	-40.519319	175.751371	149.00

Name: Obstruction 2
Upper edge height: 3.0 m

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	m
1	-40.518719	175.755639	147.00
2	-40.519094	175.756328	147.00
3	-40.519519	175.757100	147.20

Name: Obstruction 3
Upper edge height: 3.0 m

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	m
1	-40.519365	175.751373	149.00
2	-40.520279	175.750713	150.90
3	-40.521184	175.750042	152.00
4	-40.521461	175.750396	153.00
5	-40.521885	175.749479	154.00
6	-40.522501	175.749018	155.70
7	-40.523141	175.748573	157.00
8	-40.523892	175.750123	156.40
9	-40.525135	175.752762	155.00
10	-40.526053	175.754709	154.80

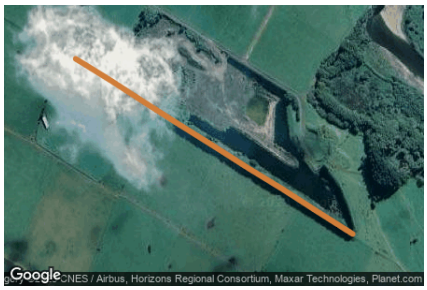
Name: Obstruction 4
Upper edge height: 3.0 m

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	m
1	-40.520925	175.747897	153.00
2	-40.521139	175.748313	153.00
3	-40.521353	175.748729	153.00
4	-40.521757	175.749238	154.00
5	-40.522399	175.748749	156.00
6	-40.523047	175.748273	157.00
7	-40.523728	175.747762	158.70
8	-40.524389	175.747264	159.00
9	-40.524069	175.746591	160.00
10	-40.523688	175.745843	160.00

Name: Obstruction 5
Upper edge height: 3.0 m

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	m
1	-40.524781	175.744788	161.00
2	-40.525166	175.745600	160.00
3	-40.525552	175.746413	160.00
4	-40.527572	175.744919	161.00
5	-40.528562	175.744188	161.70
6	-40.529592	175.743414	163.00
7	-40.528854	175.741885	163.00
8	-40.528157	175.740378	163.90
9	-40.526722	175.737353	161.00

Name: Obstruction 6
Upper edge height: 8.0 m



Vertex	Latitude	Longitude	Ground elevation
	deg	deg	m
1	-40.529083	175.757262	155.00
2	-40.528696	175.756456	155.00
3	-40.528317	175.755683	156.00
4	-40.527947	175.754882	156.00
5	-40.527560	175.754081	156.00
6	-40.527187	175.753297	156.00
7	-40.526798	175.752491	156.00
8	-40.526405	175.751690	156.00
9	-40.526033	175.750895	157.00

Name: Obstruction 7
Upper edge height: 10.0 m

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	m
1	-40.524484	175.747558	159.00
2	-40.524745	175.748079	159.00
3	-40.525006	175.748631	158.00

Name: Obstruction 8
Upper edge height: 10.0 m

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	m
1	-40.516380	175.749299	145.00
2	-40.516804	175.748526	146.00
3	-40.517130	175.747764	146.00
4	-40.517505	175.747260	146.00
5	-40.517929	175.747046	147.00

Name: Obstruction 9
Upper edge height: 10.0 m

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	m
1	-40.522574	175.737690	165.20
2	-40.522937	175.737523	163.30
3	-40.523267	175.737083	164.10

Summary of PV Glare Analysis

PV configuration and total predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File
	deg	deg	min	min	kWh	
SAT Array East	SA tracking	SA tracking	0	0	-	-
SAT Array West	SA tracking	SA tracking	0	0	-	-

PV & Receptor Analysis Results

Results for each PV array and receptor

SAT Array East no glare found

Component	Green glare (min)	Yellow glare (min)
Route: Railway	0	0

No glare found

SAT Array West no glare found

Component	Green glare (min)	Yellow glare (min)
Route: Railway	0	0

No glare found

Assumptions

- Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
- Glare analyses do not automatically account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographic obstructions.
- Detailed system geometry is not rigorously simulated.
- The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual values and results may vary.
- The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.
- Several V1 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results fo large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare.
- The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
- Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
- Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
- Refer to the **Help page** for detailed assumptions and limitations not listed here.