System Advisor Model Report

Detailed Photovoltaic - Battery	80 DC kW Nameplate	-3.11, -60.06
Single Owner	$351.05/W Installed Cost	UTC -4

PV Performance Model

Modules	
User-specified parameters	
Cell material	monoSi
Module area	2.16 m²
Module capacity	474.98 DC Watts
Quantity	168
Total capacity	79.8 DC kW
Total area	362 m²

Inverters	
Ginlong Technologies Co - Ltd : RHI-1P8K-HVES-5G	
Unit capacity	8.006 AC kW
Input voltage	185 - 450 VDC DC V
Quantity	1
Total capacity	8.01 AC kW
DC to AC Capacity Ratio	9.97
AC losses (%)	0.00

Two subarrays:	1	2
Strings	1	1
Modules per string	84	84
String Voc (DC V)	3573.36	3573.36
Tilt (deg from horizontal)	3.00	3.00
Azimuth (deg E of N)	263.7	263.7
Tracking	no	no
Backtracking	-	-
Self shading	no	no
Rotation limit (deg)	-	-
Shading	no	no
Snow	no	no
Soiling	yes	yes
DC losses (%)	4.44	4.44

Performance Adjustments	
DC avail./curtail.	none
AC avail./curtail.	none
Degradation	0.5 %/yr
Hourly or custom losses	none

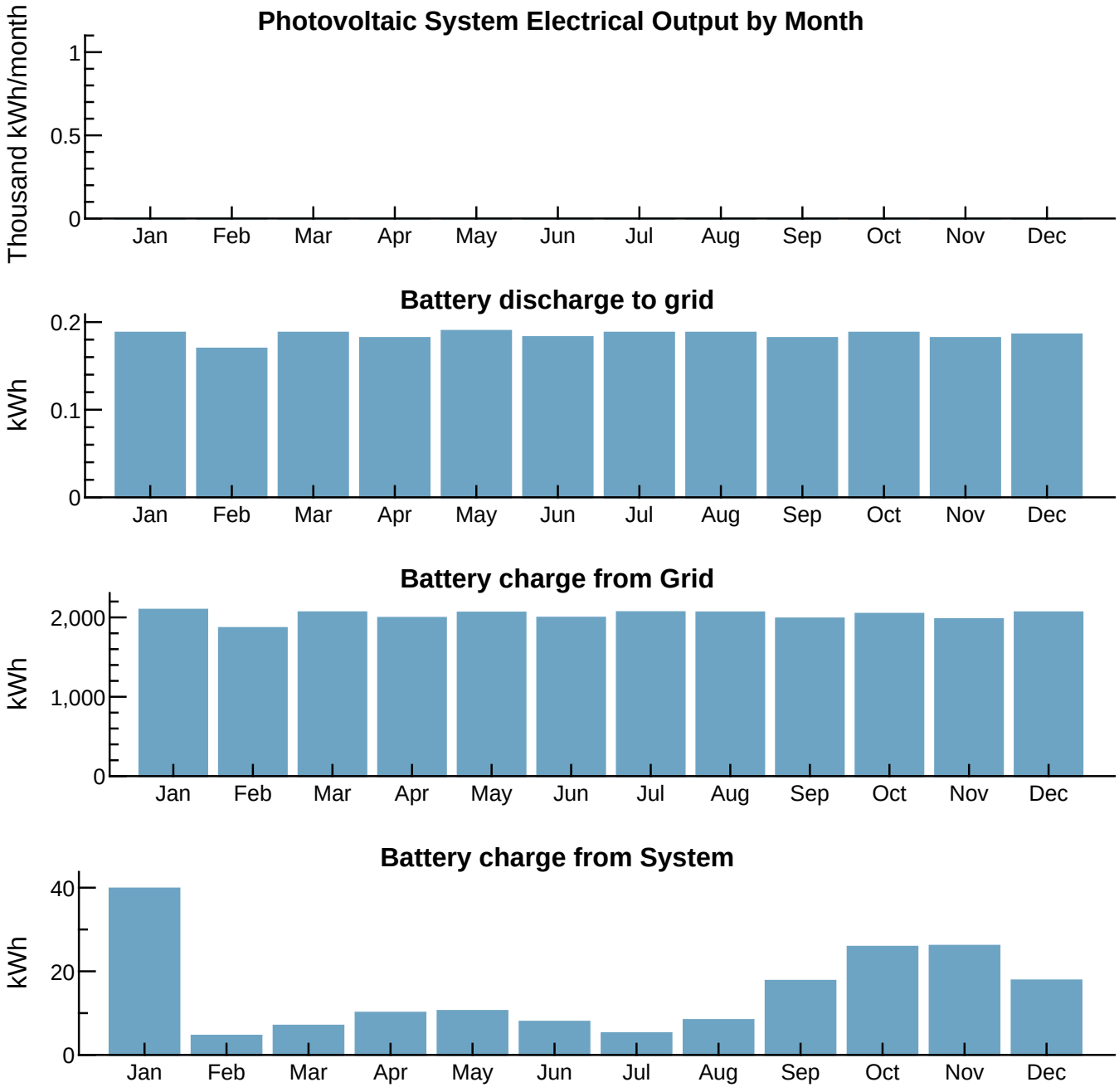
Annual Results (in Year 1)		
GHI kWh/m²/day	4.99	4.99
POA kWh/m²/day	115.00	115.00
Net to inverter	21,500 DC kWh	
Net to grid	-24,270 AC kWh	
Capacity factor	2.5	
Performance ratio	0.12	

Battery Model

Battery Specifications	
Battery capacity	240 kWh
Battery chemistry	Lithium ion
Battery dispatch option	Automated dispatch
Minimum state of charge	0.2
Maximum state of charge	0.95

Battery Charge and Discharge	
Battery Capacity	240 kWh
Battery bank voltage	48 V
Number of cells	37,500
Cells in series	15
Strings in parallel	2,500
Max discharge power (DC)	10 kW
Max charge power (DC)	10 kW
Max discharge power (AC)	9.6 kW
Max charge power (AC)	10.42 kW
Max discharge current (A)	208.33 A
Max charge current (A)	208.33 A

Battery Performance	
Roundtrip eff. (%)	92.06
Cycle conversion eff. (%)	92.06
Average cycle DoD	25.82
Number of cycles	9,124
Year 1 energy charged	24,452.81 kWh
Year 1 charged from PV	180.83 kWh
Year 1 charged from grid	24,271.98 kWh
Year 1 energy discharged	22,428.78 kWh


Photovoltaic System Electrical Output by Month
Thousand kWh/month
1
0.5
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Battery discharge to grid
kWh
0.2
0.1
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Battery charge from Grid
kWh
2,000
1,000
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Battery charge from System
kWh
40
20
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

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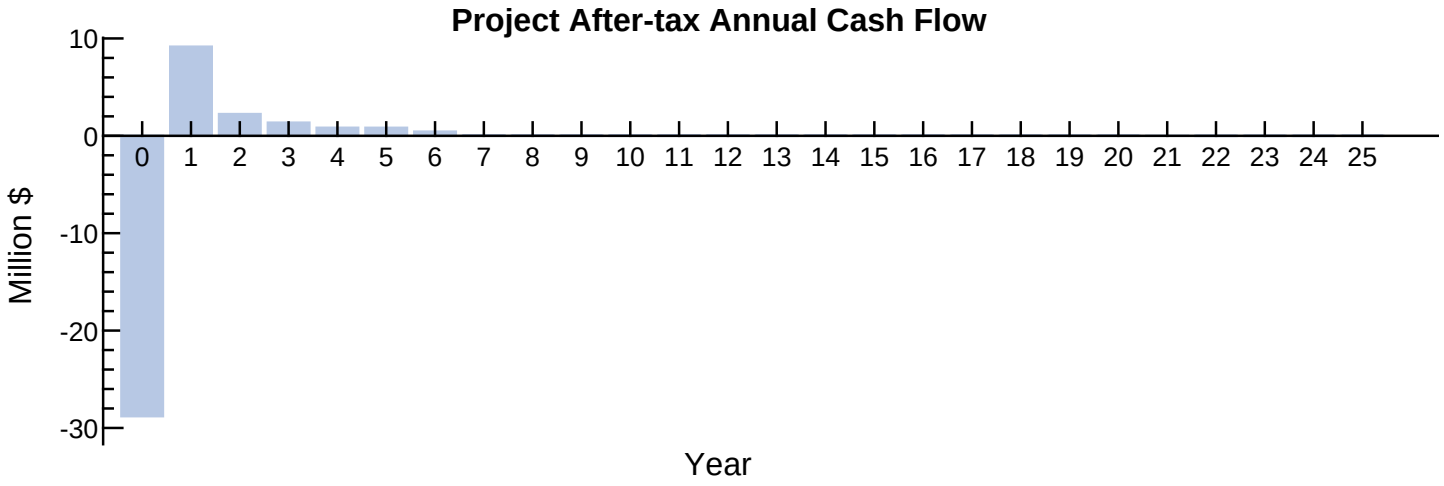


Financial Model

Project Costs	
Total installed cost	$28,012,546
Salvage value	$0

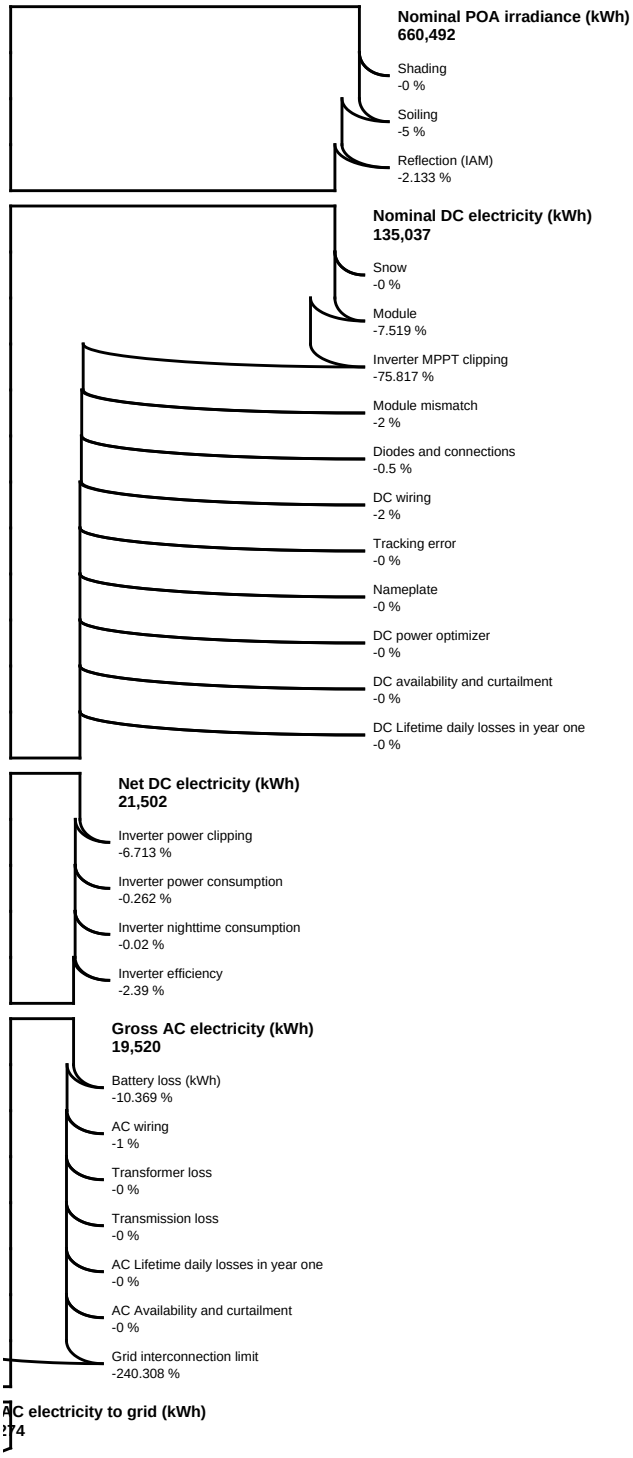
Analysis Parameters	
Project life	25 years
Inflation rate	2.5%
Real discount rate	6.4%

Financial Targets and Constraints	
Solution mode	Calculate IRR
PPA price (bid price)	7.5 cents/kWh
PPA escalation rate	1 %/year

Tax and Insurance Rates	
Federal income tax	21 %/year
State income tax	7 %/year
Sales tax (% of indirect cost basis)	5%
Insurance (% of installed cost)	0 %/year
Property tax (% of assessed val.)	0 %/year

Incentives	
Federal ITC	30%
Depreciation	Depreciation allocations defined with no bounus depreciation

Results	
Nominal LCOE	0 cents/kWh
PPA price (year one)	7.5 cents/kWh
Project IRR	target not met
Project NPV	$-15,994,700


Nominal POA irradiance (kWh)
660,492
Shading
-0 %
Soiling
-5 %
Reflection (IAM)
-2.133 %
Nominal DC electricity (kWh)
135,037
Snow
-0 %
Module
-7.519 %
Inverter MPPT clipping
-75.817 %
Module mismatch
-2 %
Diodes and connections
-0.5 %
DC wiring
-2 %
Tracking error
-0 %
Nameplate
-0 %
DC power optimizer
-0 %
DC availability and curtailment
-0 %
DC Lifetime daily losses in year one
-0 %
Net DC electricity (kWh)
21,502
Inverter power clipping
-6.713 %
Inverter power consumption
-0.262 %
Inverter nighttime consumption
-0.02 %
Inverter efficiency
-2.39 %
Gross AC electricity (kWh)
19,520
Battery loss (kWh)
-10.369 %
AC wiring
-1 %
Transformer loss
-0 %
Transmission loss
-0 %
AC Lifetime daily losses in year one
-0 %
AC Availability and curtailment
-0 %
Grid interconnection limit
-240.308 %
AC electricity to grid (kWh)
274