

150 KW PV SOLAR SYSTEM FINANCIAL EVALUATION; Project Cashflow Method; \$1,000; by Willem Post																											
Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total
PROFIT AND LOSS STATEMENT																											
Grid Price; \$/kWh, 4%/yr esc		0.06	0.06	0.06	0.07	0.07	0.07	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.12	0.12	0.13	0.13	0.14	0.14	0.15	0.15	
Standard Offer; \$/MWh		335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	335.12	
Aging Rate; 0.2%/yr																											
Production; 1,000 kWh/yr		170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	170.82	
1 Revenues		57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	57,245	1431.13
2 O & M; 2.5%/yr esc		0.900	0.923	0.946	0.969	0.993	1.018	1.044	1.070	1.097	1.124	1.152	1.181	1.210	1.241	1.272	1.303	1.336	1.369	1.404	1.439	1.475	1.512	1.549	1.588	1.628	
3 Net Revenues; (1-2)		56.30	56.23	56.30	56.28	56.25	56.23	56.20	56.18	56.15	56.12	56.09	56.06	56.03	56.00	55.97	55.94	55.91	55.88	55.84	55.81	55.77	55.73	55.70	55.66	55.62	
4a Insurance; 2.5%/yr esc.		3.642	3.733	3.826	3.922	4.020	4.121	4.224	4.329	4.437	4.548	4.662	4.779	4.898	5.021	5.146	5.275	5.407	5.542	5.680	5.822	5.968	6.117	6.270	6.427	6.587	
4b Property Taxes; 1% of (12)		9.105	9.003	8.902	8.802	8.704	8.606	8.510	8.415	8.320	8.227	8.135	8.044	7.954	7.865	7.777	7.690	7.604	7.518	7.434	7.351	7.269	7.187	7.107	7.027	6.948	
4c EBITDA; (3-4a-4b)		43.60	43.59	43.57	43.55	43.53	43.50	43.47	43.43	43.39	43.35	43.30	43.24	43.18	43.12	43.05	42.98	42.90	42.82	42.73	42.63	42.53	42.43	42.32	42.20	42.08	1076.48
4d Depreciation; Basis = 0.95*\$910,500		148.981	238.949	144.47	87.687	87.38	44.76	2.283	2.283	2.287	10.383	15.247	10.059	6.953	6.949	4.62	1.142										814.44
4e Bank Loan; 7.5%/yr for 18 yrs	325.56	316.44	306.63	296.08	284.74	272.56	259.46	245.38	230.24	213.96	196.47	177.66	157.44	135.71	112.35	87.23	60.23	31.21	0.00								
4e Amortization Payment		33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	33.54	
4f Principal Payment		9.13	9.81	10.55	11.34	12.19	13.10	14.08	15.14	16.27	17.49	18.81	20.22	21.73	23.36	25.12	27.00	29.02	31.20								325.56
4g Interest Payment		24.42	23.73	23.00	22.21	21.36	20.44	19.46	18.40	17.27	16.05	14.74	13.32	11.81	10.18	8.43	6.54	4.52	2.34								
5 Debt Coverage Ratio; 4c/4e		1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.28	1.28	1.28	1.28								
6b Pre-tax VT Inc; (4c-4d-4e)	-626.04	-129.80	-219.10	-123.90	-66.34	-65.21	-21.70	21.73	22.75	23.84	16.92	13.31	19.86	24.42	25.99	30.00	35.29	38.38	40.48	42.73	42.63	42.53	42.43	42.32	42.20	42.08	
6c VT Inc Tax; (0.085*6b)	-53.21	-11.03	-18.62	-10.53	-5.64	-5.54	-1.84	1.85	1.93	2.03	1.44	1.13	1.69	2.08	2.21	2.55	3.00	3.26	3.44	3.63	3.62	3.62	3.61	3.60	3.59	3.58	-1.37
6d Pre-tax Fed Inc; (6b-6c)	-572.83	-118.77	-200.47	-113.37	-60.70	-59.67	-19.86	19.88	20.81	21.81	15.48	12.18	18.17	22.35	23.78	27.45	32.29	35.12	37.03	39.10	39.01	38.92	38.82	38.72	38.62	38.50	
6e Fed Inc Tax; (0.35*6d)	-200.49	-41.57	-70.17	-39.68	-21.25	-20.88	-6.95	6.96	7.28	7.63	5.42	4.26	6.36	7.82	8.32	9.61	11.30	12.29	12.96	13.68	13.65	13.62	13.59	13.55	13.52	13.48	-5.17
6f After Tax Income; (4c-4d-4e-6c-6e)	-253.7	-77.20	-130.31	-73.69	-39.46	-38.78	-12.91	12.92	13.53	14.18	10.06	7.92	11.81	14.52	15.46	17.85	20.99	22.83	24.07	25.41	25.36	25.30	25.23	25.17	25.10	25.03	
6g Net Final Income; (6f-4f)		-86.32	-140.12	-84.23	-50.79	-50.97	-26.01	-1.16	-1.61	-2.10	-7.43	-10.89	-8.41	-7.21	-7.91	-7.27	-6.01	-6.20	-7.13	25.41	25.36	25.30	25.23	25.17	25.10	25.03	
CASH FLOW ANALYSIS																											
4c EBITDA; (3-4a-4b)		43.60	43.59	43.57	43.55	43.53	43.50	43.47	43.43	43.39	43.35	43.30	43.24	43.18	43.12	43.05	42.98	42.90	42.82	42.73	42.63	42.53	42.43	42.32	42.20	42.08	
6b Pre-tax VT Inc; (4c-4d-4e)	-129.80	-219.10	-123.90	-66.34	-65.21	-21.70	21.73	22.75	23.84	16.92	13.31	19.86	24.42	25.99	30.00	35.29	38.38	40.48	42.73	42.63	42.53	42.43	42.32	42.20	42.08		
6c VT Inc Tax; (0.085*6b)	-11.03	-18.62	-10.53	-5.64	-5.54	-1.84	1.85	1.93	2.03	1.44	1.13	1.69	2.08	2.21	2.55	3.00	3.26	3.44	3.63	3.62	3.62	3.61	3.60	3.59	3.58	-1.37	
6d Pre-tax Fed Inc; (6b-6c)	-118.77	-200.47	-113.37	-60.70	-59.67	-19.86	19.88	20.81	21.81	15.48	12.18	18.17	22.35	23.78	27.45	32.29	35.12	37.03	39.10	39.01	38.92	38.82	38.72	38.62	38.50		
6e Fed Inc Tax; (0.35*6d)	-41.57	-70.17	-39.68	-21.25	-20.88	-6.95	6.96	7.28	7.63	5.42	4.26	6.36	7.82	8.32	9.61	11.30	12.29	12.96	13.68	13.65	13.62	13.59	13.55	13.52	13.48	-5.17	
7 Inverter Replacement											40.50																
7a Residual Value																											
7b Installed Cost	910.63																										
8 Tax Adj grants	0.00																										
9 ITC Basis; (7b-8)	910.63																										
10 ITC Federal; 0.95*0.3*(9)	259.53																										
11 ITC Vermont; (1-0.35)*(10)/5	33.74	33.74	33.74	33.74	33.74																						
12 Less Amortization Payment (4e)	-33.54	-33.54	-33.54	-33.54	-33.54	-33.54	-33.54	-33.54	-33.54	-33.54	-33.54	-33.54	-33.54	-33.54	-33.54	-33.54	-33.54	-33.54									
13 Owner Equity	585.05																										
14 Net Cash Flow; (4c-6c-6e-7a+7b+10+11+12-13) 168,694	-585.05	355.93	132.58	93.98	70.63	70.15	18.75	1.12	0.67	0.19	-37.55	4.36	1.65	-0.26	-0.96	-2.65	-4.87	-6.20	-7.13	25.41	25.36	25.30	25.23	25.17	25.10	25.03	
INTERNAL RATE OF RETURN, IRR																											
Present Value Factor @12%	0.8929	0.8929	0.7972	0.7118	0.6355	0.5674	0.5066	0.4523	0.4039	0.3606	0.3220	0.2875	0.2567	0.2292	0.2046	0.1827	0.1631	0.1456	0.1300	0.1161	0.1037	0.0926	0.0826	0.0738	0.0659	0.0588	
Net Cash Flow x PVF	317.8	105.7	66.9	44.9	39.8	9.5	0.5	0.3	0.1	-12.1	1.3	0.4	-0.1	-0.2	-0.5	-0.8	-0.9	-0.9	3.0	2.6	2.3	2.1	1.9	1.7	1.5	586.62	
PVF = 1/(1+I/100)^Y																											
Present Value Factor @12.5%	0.8889	0.8889	0.7901	0.7023	0.6243	0.5549	0.4933	0.4385	0.3897	0.3464	0.3079	0.2737	0.2433	0.2163	0.1922	0.1709	0.1519	0.1350	0.1200	0.1067	0.0948	0.0843	0.0749	0.0666	0.0592	0.0526	
Net Cash Flow x PVF	316.4	104.8	66.0	44.1	38.9	9.3	0.5	0.3	0.1	-11.6	1.2	0.4	-0.1	-0.2	-0.5	-0.7	-0.8	-0.9	2.7	2.4	2.1	1.9	1.7	1.5	1.3	580.75	
PVF = 1/(1+I/100)^Y																											
IRR = 12% + (Sum of NPV@12% - Cash Flow Out)/(Sum of NPV@12% - Sum of NPV@12.5%) x (12.5-12)% =																											12.134 %
The 150 kW, PV solar system, installed cost \$910,500, or \$6,070/kW																											
It is expected to produce 150 kW x 8,760 hrs/yr x CF 0.13 = 171,000 kWh/yr; CF = 0.13, used by VT-PSB, accounts for production decline because of aging of PV panels and increased outages of system as it ages.																											
PV panel efficiency is affected by dust, snow, shadows, higher summer temperatures.																											
PV system life is assumed at 25 years, after which PV panels may be replaced and other items are upgraded/refurbished/replaced.																											
Operation and Maintenance, O & M, costs are assumed at 0.1% per year of installed cost, inflating at 2.5% per year. The O & M percentage may increase as the system ages.																											