

Solar cost install (figure 8)

Data source: <http://eetd.lbl.gov/ea/emp/pre-pubs.html>

US solar capacity additions (figure 1)

Installation Year	Total solar cost \$/watt	Solar module \$/w	Non-module cost \$/w
1998	11.0	4.8	6.1
1999	10.8	4.8	6.0
2000	9.7	4.7	4.9
2001	10.0	4.3	5.7
2002	9.9	3.9	6.0
2003	8.7	3.6	5.1
2004	8.4	3.8	4.6
2005	7.9	4.0	3.8
2006	7.9	4.2	3.7
2007	7.9	4.1	3.7
2008	7.6	3.7	3.9
2009	7.5	2.8	4.7
2010	6.2	2.4	3.8
average	-3.97%	-4.55%	-3.43%

Reduction rate per year

-1.82%	0.00%
-10.19%	-2.08%
3.09%	-8.51%
-1.00%	-9.30%
-12.12%	-7.69%
-3.45%	5.56%
-5.95%	5.26%
0.00%	5.00%
0.00%	-2.38%
-3.80%	-9.76%
-1.32%	-24.32%
-17.33%	-14.29%
-4.49%	-5.21%

U.S. Annual Capacity Additions	U.S. Cumulative Capacity
1.9	11.3
2.8	14.2
3.9	18.1
11.4	29.5
22.8	52.2
45.5	97.7
57.8	155.5
79.3	234.8
104.8	339.7
169.4	509.0
309.6	818.6
435.5	1,254.1
883.2	2,137.3
4216.75%	1710.38%

install rate growth	Year
47.37%	1998
39.29%	1999
192.31%	2001
100.00%	2002
99.56%	2003
27.03%	2004
37.20%	2005
32.16%	2006
61.64%	2007
82.76%	2008
40.67%	2009
102.80%	2010
71.90% average	

Net benefits from pay it forward	
Solar, 25 yr	\$2,297,331,267
Wind, 15 yr	\$1,228,271,949
MWH per year in 2022	
Solar	12,014
Wind	7,036,470
Minneapolis load	5,100,000
Surplus	1,948,484

Pay It Forward Solar assumptions (5kw average per roof)

25 year net value

\$2,297,331,267

Installation Year	Total solar cost \$/watt	Solar module \$/w	KW installed capacity	Number of projects	Cumulative Kilowatts	Cumulative number of projects	Local (MN) mfg. And installation	Yearly kilowatt-hrs	Electric price	Energy dollars that stay in state	Cumulative cost	Cumulative energy dollars saved	Net benefit to state
Rate Assumpti	-7.50%	-8.00%	100.00%	5	5	1	\$45,000	13,40%	7.50%				
2012	\$9.00	\$5.00	5	1	5	1	\$45,000	5,869	\$0.11	\$646	\$45,000	\$646	-\$44,354
2013	\$8.33	\$4.60	10	2	15.0	3	\$83,250	17,608	\$0.12	\$2,082	\$128,250	\$2,728	-\$125,522
2014	\$7.70	\$4.23	20	4	35.0	7	\$154,013	41,084	\$0.13	\$5,223	\$282,263	\$7,950	-\$274,312
2015	\$7.12	\$3.89	40	8	75.0	15	\$284,923	88,038	\$0.14	\$12,031	\$567,186	\$19,981	-\$547,205
2016	\$6.59	\$3.58	80	16	155.0	31	\$527,108	181,945	\$0.15	\$26,728	\$1,094,293	\$46,709	-\$1,047,584
2017	\$6.09	\$3.30	160	32	315.0	63	\$975,149	369,760	\$0.16	\$58,392	\$2,069,443	\$105,101	-\$1,964,342
2018	\$5.64	\$3.03	320	64	635.0	127	\$1,804,026	745,388	\$0.17	\$126,539	\$3,873,469	\$231,641	-\$3,641,829
2019	\$5.21	\$2.79	640	128	1275.0	255	\$3,337,449	1,496,646	\$0.18	\$273,131	\$7,210,918	\$504,772	-\$6,706,146
2020	\$4.82	\$2.57	1280	256	2555.0	511	\$6,174,280	2,999,161	\$0.20	\$588,383	\$13,385,198	\$1,093,155	-\$12,292,044
2021	\$4.46	\$2.36	2560	512	5115.0	1023	\$11,422,419	6,004,192	\$0.21	\$1,266,262	\$24,807,617	\$2,359,416	-\$22,448,201
2022	\$4.13	\$2.17	5120	1024	10235.0	2047	\$21,131,474	12,014,252	\$0.23	\$2,723,793	\$45,939,091	\$5,083,209	-\$40,855,882
2023	\$3.82	\$2.00	7680	1536	17915.0	3071	\$29,319,921	21,029,344	\$0.24	\$5,125,208	\$75,259,012	\$10,208,417	-\$65,050,594
2024	\$3.53	\$1.84	11520	2304	29435.0	5887	\$40,681,390	34,551,980	\$0.26	\$9,052,472	\$115,940,401	\$19,260,890	-\$96,679,512
2025	\$3.27	\$1.69	17280	3456	46715.0	9343	\$56,445,428	54,835,936	\$0.28	\$15,444,291	\$172,385,830	\$34,705,181	-\$137,680,649
2026	\$3.02	\$1.56	25920	5184	72635.0	14527	\$78,318,032	85,261,868	\$0.30	\$25,814,637	\$250,703,862	\$60,519,818	-\$190,184,044
2027	\$2.79	\$1.43	38880	7776	111515.0	22303	\$108,666,269	130,900,768	\$0.33	\$42,605,125	\$359,370,131	\$103,124,943	-\$256,245,188
2028	\$2.59	\$1.32	58320	11664	169835.0	33967	\$150,774,448	199,359,116	\$0.35	\$69,753,212	\$510,144,579	\$172,878,155	-\$337,266,424
2029	\$2.39	\$1.21	87480	17496	257315.0	51463	\$209,199,547	302,046,640	\$0.38	\$113,608,437	\$719,344,127	\$286,486,593	-\$432,857,534
2030	\$2.21	\$1.11	131220	26244	388535.0	77707	\$290,264,372	456,077,924	\$0.40	\$184,409,841	\$1,009,608,499	\$470,896,433	-\$538,712,065
2031	\$2.05	\$1.03	196830	39366	585365.0	117073	\$402,741,816	687,124,852	\$0.43	\$298,668,322	\$1,412,350,314	\$769,564,756	-\$642,785,559
2032	\$1.89	\$0.94	295245	59049	880610.0	176122	\$558,804,270	1033695242	\$0.47	\$483,008,182	\$1,971,154,584	\$1,252,572,938	-\$718,581,647
2033	0	0	0	0	880610.0	176122	\$0	1033695242	\$0.50	\$519,233,796	\$1,971,154,584	\$1,771,806,733	-\$199,347,851
2034	0	0	0	0	880610.0	176122	\$0	1033695242	\$0.54	\$5,58E+8	\$1,971,154,584	\$2,329,983,064	\$358,828,479
2035	0	0	0	0	880610.0	176122	\$0	1033695242	\$0.58	\$6,00E+8	\$1,971,154,584	\$2,930,022,619	\$958,868,035
2036	0	0	0	0	880610.0	176122	\$0	1033695242	\$0.62	\$6,45E+8	\$1,971,154,584	\$3,575,065,140	\$1,603,910,556
2037	0	0	0	0	880610.0	176122	\$0	1033695242	\$0.67	\$6,93E+8	\$1,971,154,584	\$4,268,485,851	\$2,297,331,267

Pay It Forward Wind assumptions (see <http://eetd.lbl.gov/ea/emp/reports/lbni-5119e.pdf>)

15 year net value

\$1,228,271,949

Installation Year	Total turbine cost \$/watt	Single turbine cost (MW input)	MW new installed capacity	Number of turbines	Cumulative Megawatts	Cumulative number of turbines	Midwest mfg. And installation	Megawatt-hours/year	Electric price/MWH	Energy dollars that stay in state	Cumulative cost	Cumulative energy dollars saved	Net benefit to state
Rate Assumpti	-4.00%	3	100.00%	3	3	3	\$13,500,000	27,594	35.00%	6.00%			
2015	\$1.50	\$4,500,000	9	3	9	3	\$13,500,000	27,594	\$30.00	\$827,820	\$13,500,000	\$827,820	-\$12,672,180
2016	\$1.44	\$4,320,000	18	6	27	9	\$25,920,000	82,782	\$31.80	\$2,632,468	\$39,420,000	\$3,460,288	-\$35,959,712
2017	\$1.38	\$4,147,200	36	12	63	21	\$49,766,400	193,158	\$33.71	\$6,510,970	\$89,186,400	\$9,971,257	-\$79,215,143
2018	\$1.33	\$3,981,312	72	24	135	45	\$95,551,488	413,910	\$35.73	\$14,789,203	\$184,737,888	\$24,760,460	-\$159,977,428
2019	\$1.27	\$3,822,060	144	48	279	93	\$183,458,857	855,414	\$37.87	\$32,398,214	\$368,196,745	\$57,158,674	-\$311,038,071
2020	\$1.22	\$3,669,177	288	96	567	189	\$352,241,005	1,738,422	\$40.15	\$69,792,024	\$720,437,750	\$126,950,698	-\$593,487,052
2021	\$1.17	\$3,522,410	576	192	1143	381	\$676,302,730	3,504,438	\$42.56	\$149,133,368	\$1,396,740,481	\$276,084,066	-\$1,120,656,414
2022	\$1.13	\$3,381,514	1152	384	2295	765	###	7,036,470	\$45.11	\$317,407,476	\$2,695,241,723	\$593,491,543	-\$2,101,750,180
2023	0	0	0	0	2295	765	\$0	7,036,470	\$47.82	\$336,451,925	\$2,695,241,723	\$929,943,467	-\$1,765,298,255
2024	0	0	0	0	2295	765	\$0	7,036,470	\$50.68	\$356,639,040	\$2,695,241,723	\$1,286,582,508	-\$1,408,659,215
2025	0	0	0	0	2295	765	\$0	7,036,470	\$53.73	\$378,037,383	\$2,695,241,723	\$1,664,619,891	-\$1,030,621,832
2026	0	0	0	0	2295	765	\$0	7,036,470	\$56.95	\$400,719,626	\$2,695,241,723	\$2,065,339,516	-\$629,902,207
2027	0	0	0	0	2295	765	\$0	7,036,470	\$60.37	\$424,762,803	\$2,695,241,723	\$2,490,102,319	-\$205,139,403
2028	0	0	0	0	2295	765	\$0	7,036,470	\$63.99	\$450,248,571	\$2,695,241,723	\$2,940,350,891	\$245,109,168
2029	0	0	0	0	2295	765	\$0	7,036,470	\$67.83	\$477,263,486	\$2,695,241,723	\$3,417,614,377	\$722,372,654
2030	0	0	0	0	2295	765	\$0	7,036,470	\$71.90	\$505,899,295	\$2,695,241,723	\$3,923,513,672	\$1,228,271,949