


Energy production analysis

1.) Power plants with Day4Energy photovoltaic modules

Information on the operation of solar power plants has been collected by measuring the production of electricity, which are publicly available on the company Solera web portal. The analysis covers data of 12 solar power stations, which are located in 12 different locations in Germany. Common component to all power plants is that they have installed Day4Energy photovoltaic modules, which boasts the most advanced technology in production of photovoltaic modules and that generate maximum energy yield. Other components such as inverters and power cables are different. Azimuth direction and slope vary from one to another power plant, which results lower or higher yield expressed as kilowatt hours per kilowatt of the installed power produced in one year.

Anlysis on the production of sun power plants with  modules													
Period: December 2009 - November 2010													
Location: Germany (12 different locations)													
Source: http://solera.solarlog-portal.de/2050.html													
PV plant	dec.09	jan.10	feb.10	mar.10	apr.10	maj.10	jun.10	jul.10	avg.10	sep.10	okt.10	nov.10	Specific yeald
Überlinger1	20,13	22,59	46,14	106,05	141,19	110,21	131,17	150,85	118,35	111,33	73,49	35,94	1067,44 kWh/kWp
Betzingen1	32,69	27,58	41,12	95,29	139,41	97,25	133,16	154,47	116,29	111,84	81,54	27,12	1057,76 kWh/kWp
Rottenburg2	25,95	29,06	51,74	102,58	136,46	97,05	131,68	146,93	116,09	108,26	84,82	33,67	1064,27 kWh/kWp
Frittlingen2	27,16	26,91	44,70	97,78	129,34	95,82	129,12	149,31	116,42	117,68	88,86	36,40	1059,48 kWh/kWp
Frittlingen3	28,81	35,33	48,71	100,05	126,26	94,19	125,62	145,93	113,83	115,69	89,55	38,38	1062,36 kWh/kWp
Albstadt2	25,30	29,58	42,55	100,87	132,55	89,10	120,33	153,00	115,76	115,30	89,51	29,86	1043,72 kWh/kWp
Balingen9	24,22	27,59	51,18	100,11	133,29	92,32	128,69	150,55	117,58	114,29	86,46	38,04	1064,29 kWh/kWp
Frommern3	23,66	33,91	50,30	100,90	132,87	92,49	124,93	145,70	116,08	111,92	87,16	39,14	1059,07 kWh/kWp
Geislengen10	15,83	31,11	57,23	109,33	139,12	95,57	133,28	153,30	122,61	118,45	89,42	43,37	1108,61 kWh/kWp
Leidringen1	23,05	24,97	49,57	100,92	133,93	95,34	133,58	152,62	117,49	115,50	86,68	34,48	1068,13 kWh/kWp
Leidringen2	23,12	23,99	50,27	99,48	137,92	97,83	137,76	155,37	121,19	117,73	91,07	35,19	1090,92 kWh/kWp
Rosenfeld2	24,40	29,27	51,38	105,19	131,08	88,08	126,78	146,37	107,09	115,22	85,89	36,18	1046,92 kWh/kWp
AVERAGE	24,53	28,49	48,74	101,54	134,45	95,44	129,67	150,37	116,56	114,43	86,20	35,65	1066,08 kWh/kWp

2.) Photon laboratory test

Photon Laboratory test is currently the only test in the history of photovoltaic industry measuring the production of electricity of more than 40 different photovoltaic modules. The test field is placed in an optimal direction for Germany, namely the azimuth direction of 0° to the south with inclination of 28°. The table contains measurements for a year and a comparison between the measured energy outputs. Since all modules in the table have not been on a test field from the start of measuring period, the missing data in red are calculated.

Photon Laboratory test																
Period: December 2009 - November 2010																
Location: Germany																
estimate as an average of 6 modules on the field from the beginning																
data published in Photon Magazine																
		dec.09	jan.10	feb.10	mar.10	apr.10	maj.10	jun.10	jul.10	avg.10	sep.10	okt.10	nov.10	Specific yield	% behind 1st	
Siliken	poly	14,47	15,37	35,80	97,43	140,38	109,72	155,85	156,44	116,30	98,90	82,30	26,40	1049,36	kWh/kWp	0,00%
REC Solar	poly	14,57	17,08	35,50	99,09	139,96	102,84	154,95	155,65	116,60	100,50	83,70	27,60	1048,04	kWh/kWp	-0,13%
Aleo Solar	poly	16,91	19,83	43,66	113,48	135,30	98,92	147,15	150,49	112,70	97,30	81,00	26,80	1043,53	kWh/kWp	-0,56%
Wineryg Solar	poly	14,11	16,57	37,01	95,56	138,37	108,60	152,98	150,94	112,90	97,10	80,10	25,80	1030,04	kWh/kWp	-1,84%
Trina mono	mono	14,15	17,45	38,14	95,42	135,72	105,81	150,64	151,68	113,00	96,90	80,80	26,20	1025,91	kWh/kWp	-2,23%
Bisol	poly	14,25	16,71	38,43	97,55	137,08	100,07	149,44	151,31	113,50	98,00	81,60	27,40	1025,35	kWh/kWp	-2,29%
Solarworld mono	mono	14,79	17,34	38,19	95,96	135,83	100,10	150,58	151,10	113,60	98,00	81,50	27,70	1024,69	kWh/kWp	-2,35%
Mage Solar	poly	14,24	18,75	38,36	95,33	135,27	105,53	149,87	150,67	112,50	96,40	80,30	26,30	1023,52	kWh/kWp	-2,46%
S-Energy	poly	14,34	15,46	34,22	96,14	136,18	106,02	151,10	152,13	113,50	97,40	80,50	26,20	1023,19	kWh/kWp	-2,49%
CNPV	mono	14,51	17,01	37,47	92,04	136,70	100,46	151,47	152,96	113,90	98,10	81,60	26,50	1022,73	kWh/kWp	-2,54%
PV Power Technologies	poly	14,03	15,39	34,78	94,15	135,77	106,71	152,75	153,71	113,90	96,60	78,70	25,90	1022,39	kWh/kWp	-2,57%
FFT CS Solar	poly	14,16	17,83	38,36	95,10	135,16	105,60	150,16	150,88	112,50	96,50	79,60	26,10	1021,95	kWh/kWp	-2,61%
First Solar	CdTe	13,27	21,87	39,18	91,99	132,49	102,04	150,13	154,98	113,40	96,00	77,70	25,70	1018,75	kWh/kWp	-2,92%
Trina poly	poly	14,01	16,43	37,13	96,44	135,94	99,37	149,16	150,81	112,80	97,20	80,80	26,90	1016,99	kWh/kWp	-3,08%
Sunpeak	mono	14,88	17,45	38,44	95,80	134,75	99,20	149,05	149,37	112,30	96,90	80,70	26,90	1015,75	kWh/kWp	-3,20%
Solarworld poly	poly	14,36	17,18	38,72	95,08	134,86	98,45	148,30	150,53	112,40	96,40	80,00	25,60	1011,88	kWh/kWp	-3,57%
Conergy	poly	14,41	16,89	37,21	92,00	135,60	99,02	147,03	150,30	112,80	97,30	81,30	26,90	1010,76	kWh/kWp	-3,68%
Emmvee Solar	poly	14,33	16,80	37,00	91,76	134,99	98,59	147,69	150,77	113,00	97,20	80,80	26,30	1009,22	kWh/kWp	-3,82%
Sunrise Solartech	mono	13,84	16,14	37,20	93,44	133,54	104,59	149,22	150,19	111,50	95,30	78,20	25,80	1008,96	kWh/kWp	-3,85%
Photowatt	poly	14,01	15,00	32,56	94,72	135,01	103,45	148,54	151,24	112,50	96,10	79,30	25,60	1008,03	kWh/kWp	-3,94%
Upsolar	mono	14,10	16,54	36,42	90,75	134,16	98,33	149,16	150,31	112,50	97,10	80,80	26,70	1006,87	kWh/kWp	-4,05%
Solarfun 24-1M	mono	13,07	15,32	35,84	94,56	134,48	98,48	148,16	151,23	112,50	96,80	80,10	25,40	1005,94	kWh/kWp	-4,14%
Shell mono	mono	13,60	14,34	35,23	94,23	133,57	102,41	146,76	148,43	111,10	95,50	79,40	25,50	1000,07	kWh/kWp	-4,70%
Sonalis	mono	14,21	16,67	36,70	91,18	134,07	97,92	145,58	148,86	111,40	96,00	80,10	26,40	999,09	kWh/kWp	-4,79%
Shell CIS	CIS	13,32	16,97	37,00	94,14	134,48	101,44	146,07	144,34	109,90	94,40	77,20	24,20	993,46	kWh/kWp	-5,33%
Evergreen 120	ribbon	13,63	15,44	36,85	93,98	132,30	101,01	144,52	141,56	109,80	95,30	79,40	26,50	990,29	kWh/kWp	-5,63%
CSI	poly	13,52	15,37	34,85	91,80	129,57	99,39	140,65	142,69	107,70	92,30	75,40	24,70	967,94	kWh/kWp	-7,76%
Solarfun M5-24	mono	13,10	15,97	35,84	89,53	127,89	99,52	142,37	142,92	106,10	90,50	75,10	24,20	963,04	kWh/kWp	-8,23%
Evergreen 180	ribbon	13,45	14,58	32,02	91,56	130,26	98,95	141,32	142,76	106,20	91,30	75,50	24,60	962,50	kWh/kWp	-8,28%
Solar-Fabrik 130	mono	14,06	16,49	36,33	86,89	129,05	93,06	142,05	142,41	106,60	92,10	76,70	23,20	958,94	kWh/kWp	-8,62%
Isofoton 170	mono	12,72	13,68	30,70	88,25	128,77	99,69	143,99	145,04	106,50	89,00	73,50	23,00	954,84	kWh/kWp	-9,01%
Isofoton 110	mono	12,62	13,25	30,78	89,04	128,77	97,13	142,30	144,38	105,80	90,90	75,00	22,60	952,57	kWh/kWp	-9,22%
BP Solar	mono	12,72	14,20	32,74	88,83	127,55	97,75	140,43	142,34	105,80	90,30	74,10	24,00	950,76	kWh/kWp	-9,40%
Kyocera	poly	12,94	13,55	31,31	89,24	127,90	92,77	140,84	142,41	106,00	91,20	75,50	23,80	947,46	kWh/kWp	-9,71%
Solar-Fabrik 145	EFG	12,30	13,43	30,26	87,27	126,82	95,80	139,92	143,11	105,60	90,30	74,10	22,50	941,41	kWh/kWp	-10,29%
Schott Solar	EFG	12,75	14,02	30,71	87,90	126,36	95,64	139,15	141,87	105,20	90,10	74,60	23,10	941,40	kWh/kWp	-10,29%
Sunways	poly	12,20	13,88	29,88	86,80	125,60	95,52	139,77	142,50	105,20	89,80	73,90	23,00	938,05	kWh/kWp	-10,61%
Sharp	mono	12,49	13,32	29,59	84,86	120,99	92,64	140,07	140,74	102,10	87,60	72,40	23,30	920,10	kWh/kWp	-12,32%
Kioto PV	poly	13,31	17,39	36,14	87,85	124,63	97,38	135,18	131,35	96,80	81,70	67,50	22,50	911,73	kWh/kWp	-13,12%
PROJECTION - average of 12 power plants														More energy		
Day4Energy	poly	24,526	28,491	48,741	101,54	134,45	95,437	129,67	150,37	116,56	114,43	86,204	35,648	1066,08	kWh/kWp	1,59%

The comparison of results between the tables shows that Day4Energy modules providing highest energy output. It is especially necessary to emphasize that we have an average value of the energy yield calculated on the basis of 12 different solar power plants in 12 different locations, which further increases the results reliability of operation of solar power plants with Day4Energy modules. Last but not least, data for Day4Energy modules were taken from the power plants with significantly larger number of modules connected together as are on Photone Laboratory test field.

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