

## LAMPIRAN


### Lampiran 1 Data Kebutuhan Listrik PT Pindad Persero

2021/10/15 16:12  
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LAMPIRAN SURAT TAGIHAN LISTRIK  
 N O M O R    B / 24 / PA / III / 2021  
 T A N G G A L    5    M A R E T 2021

**REKAPITULASI BIAYA PEMAKAIAN LISTRIK  
 YANG HARUS DIBEBANKAN/DITAGIHKAN KE UNIT MASIING-MASIING  
 UNTUK PEMAKAIAN BULAN FEBRUARI 2021 TAGIHAN BULAN MARET 2021**

NO	UNIT PEMAKAI	JUMLAH BIAYA PEMAKAIAN	KETERANGAN
1	INFRASTRUKTUR PERHUBUNGAN	Rp. 489.188.515,33	AGAR DITAGIHKAN/DIBEBANKAN KEPADA UNIT MASIING-MASIING.
2	SENJATA	Rp. 301.560.663,62	
3	DIV. PERALATAN INDUSTRI DAN JASA	Rp. 98.967.328,65	
4	DIV. ALAT BERAT	Rp. 33.020.975,97	
5	DIV. KENDARAAN KHUSUS	Rp. 25.050.981,97	
6	DIV. MINING SERVICE	Rp. 1.613.831,29	
7	DIV. TEKNOLOGI INFORMASI	Rp. 1.838.469,25	
	DIV. CORPORATE UNIVERSITY	Rp. 128.692,85	
8	DIV. MAN. PT PEI	Rp. 29.638.355,90	
9	RUMAH SAKIT UMUM PINDAD	Rp. 57.254.413,65	
10	YAYASAN CAKRA BINANGKIT	Rp. 1.021.736,16	
11	PUSAT LOGISTIK BERIKAT	Rp. 835.067,20	
12	ATM BNI CAB. ITB	Rp. 327.936,95	
13	ATM MANDIRI	Rp. 396.534,84	
14	ATM B R I	Rp. 552.574,91	
15	KOPKAR PINDAD	Rp. 3.497.883,08	
16	DAPEN	Rp. 748.234,00	
17	PT PEI PUSAT	Rp. 1.397.236,63	
18	CMI (EX. SIEMENS)	US\$ 13,67	

PT PINDAD (PERSERO)  
 WS. MANAGER GENERAL AFFAIR  
  
**PRIYONO**

PEMAKAIAN KWH DIVISI SENJATA  
TAGIHAN BULAN JULI 2021

NO	LOKASI METER	POSISI	STAND METER		PEMAKAIAN	FAKTOR X	KWH
			05/21	07/21			
1	PPTQF-A (LC GED. 23)	LWBP	31.430,00	31.612,00	182,00	100	18.200,00
2	PPTQF-B (LC GED. 23)	LWBP	32.448,00	32.639,00	191,00	100	19.100,00
3	PP GEN 1 (LC GED. 23)	LWBP	2.800,50	2.839,50	39,00	100	3.900,00
4	PP PAINT (LC GED. 23)	LWBP	10.614,00	10.662,00	48,00	100	4.800,00
5	GED. 177 (LC GED. 23)	LWBP	3.302,20	3.302,20	-	100	-
6	GED. 178 (LC GED. 23)	LWBP	4.585,00	4.609,50	24,50	100	2.450,00
7	PPD & ER (LC GED. 23)	LWBP	35.287,00	35.425,50	138,50	100	13.850,00
8	TF09 (LC GED. 23)	LWBP	560,58	666,37	105,79	300	31.737,00
9	TD11 (LC GED. 23)	LWBP	6.680,61	7.106,07	425,46	300	127.638,00
10	LC 09 GED. 23 (TD 09)	LWBP	2.338,42	2.432,39	93,97	300	28.191,00
11	LC FNC TF 08	LWBP	1.125,74	1.317,14	191,40	300	57.420,00
12	LC-FNC-TF 07 H	LWBP	4.280,82	4.289,68	8,86	300	2.658,00
13	GED. 11 (380 V)	LWBP	5.897,30	5.904,40	7,10	80	568,00
14	GED. 11 (220 V)	LWBP	3.192,50	3.196,10	3,60	80	288,00
15	GED. 175 (220 V)	LWBP	8.629,50	8.631,20	1,70	80	136,00
16	LC PERKAKAS GED. 15 (TD16)	LWBP	4.198,47	4.219,29	20,82	300	6.246,00
17	LC GED. 110 TF 10	LWBP	201,26	219,37	18,11	300	5.433,00
18	GED 110 (380V) MSN KOMATSU	LWBP	1.497,80	1.500,40	2,60	80	208,00
19	LC 8A (Ex. UTC)	LWBP	1.817,31	1.826,17	8,86	300	2.658,00
20	GD. 206 (Ex. Gudang TC)					JUMLAH I	322.823,00
	KWH PENGURANGAN						
1	KOMPRESSOR GED. 38	LWBP	56,90	56,90	-	40	-
2	PP CRANE/LOK. LC GED 23	LWBP	14.277,00	14.298,00	21,00	100	2.100,00
3	PPBH/LOKASI LC GED. 23	LWBP	188,20	189,50	1,30	80	104,00
4	PP02/LOKASI LC GED. 23	LWBP	139,90	139,90	-	80	-
5	KOMPRESSOR GED. 41 SULLAIR	WBP	2.255,70	2.669,00	413,30	100	41.330,00
6	UPSETER 1 LC 23	LWBP	14.464,00	14.477,00	13,00	100	1.300,00
7	UPSETER 2 LC 23	LWBP	27.043,00	27.048,50	5,50	100	550,00
8	PANEL GD.23	LWBP	735,05	760,90	25,85	80	2.068,00
						JUMLAH II	47.452,00
						JUMLAH TOTAL PEMAKAIAN KWH	275.371,00
	PERHITUNGAN TARIF				(Rp.)		(Rp.)
	BEA PEMAKAIAN (A1) = KWH X TARIF =		275.371,00		1.113,49	=	306.623.680,90
	BEA BEBAN (A2)		0,00%		0	=	-
	PJU = 3% X BEA PEMAKAIAN =		3,00%		306.623.680,90	=	9.198.710,43
	PENYESUAIAN = f PIN X (A1 + A2) =		0,00%		306.623.680,90	=	-
						TOTAL	315.822.391,33

PT PINDAD (PERSERO)  
WS. MANAGER GENERAL AFFAIR

  
DEDIE KUSWENDY

PEMAKAIAN KWH DIVISI SENJATA  
TAGIHAN BULAN FEBRUARI 2021

NO	LOKASI METER	POSISI	STAND METER		PEMAKAIAN	FAKTOR X	KWH
			01/21	02/21			
1	PPTQF-A (LC GED. 23)	LWBP	31.101,00	31.167,60	66,60	100	6.660,00
2	PPTQF-B (LC GED. 23)	LWBP	32.114,00	32.176,60	62,60	100	6.260,00
3	PP GEN 1 (LC GED. 23)	LWBP	2.731,50	2.748,80	17,30	100	1.730,00
4	PP. PAINT (LC GED. 23)	LWBP	10.248,00	10.334,40	86,40	100	8.640,00
5	GED. 177 (LC GED. 23)	LWBP	3.302,20	3.302,20	-	100	-
6	GED. 176 (LC GED. 23)	LWBP	4.406,00	4.443,00	37,00	100	3.700,00
7	PPD & ER (LC GED. 23)	LWBP	34.990,00	35.024,40	34,40	100	3.440,00
8	TF09 (LC GED. 23)	LWBP	9.633,84	9.825,08	191,24	300	57.372,00
9	TD11 (LC GED. 23)	LWBP	4.912,47	5.248,66	336,19	300	100.857,00
10	LC 09 GED. 23 (TD 09)	LWBP	1.816,17	1.904,00	87,83	300	26.349,00
11	LC FNC TF 08	LWBP	10.073,46	10.281,82	208,36	300	62.508,00
12	LC-FNC-TF 07 H	LWBP	4.199,57	4.213,14	13,57	300	4.071,00
13	GED. 11 (380 V)	LWBP	5.854,40	5.863,85	9,45	80	756,00
14	GED. 11 (220 V)	LWBP	3.168,85	3.195,00	26,15	80	2.092,00
15	GED. 175 (220 V)	LWBP	8.618,30	8.620,10	1,80	80	144,00
16	LC PERKAKAS GED. 15 (TD16)	LWBP	4.066,48	4.098,40	31,92	300	9.576,00
17	LC GED. 110 TF 10	LWBP	111,85	123,44	11,59	300	3.477,00
18	GED 110 (380V) MSN KOMATSU	LWBP	1.485,10	1.487,10	2,00	80	160,00
19	LC 8A (Ex. UTC)	LWBP	1.725,92	1.750,17	24,25	300	7.275,00
20	GD. 206 (Ex. Gudang TC)						
						JUMLAH I	297.792,00
	<b>KWH PENGURANGAN</b>						
1	KOMPRESSOR GED. 38	LWBP	56,90	56,90	-	40	-
2	PP CRANE/LOK. LC GED.23	LWBP	14.167,80	14.191,10	23,30	100	2.330,00
3	PPBH/LOKASI LC GED. 23	LWBP	180,60	182,15	1,55	80	124,00
4	PP02/LOKASI LC GED. 23	LWBP	139,90	139,90	-	80	-
5	KOMPRESSOR GED. 41 SULLAIR	WBP	337,35	738,00	400,65	100	40.065,00
6	UPSETER 1 LC 23	LWBP	14.417,60	14.426,70	9,10	100	910,00
7	UPSETER 2 LC 23	LWBP	27.037,40	27.036,80	1,40	100	140,00
8	PANEL GD.23	LWBP	605,70	605,70	-	80	-
						JUMLAH II	43.569,00
						JUMLAH TOTAL PEMAKAIAN KWH	254.223,00
					(Rp.)		(Rp.)
	PERHITUNGAN TARIF						
	BEA PEMAKAIAN (A1) = KWH X TARIF =		254.223,00	1.116,92	=		283.946.244,71
	BEA BEBAN (A2)		0,00%	0	=		-
	BPJU = 3% X BEA PEMAKAIAN =		3,00%	283.946.244,71	=		8.518.387,34
	PENYESUAIAN = 1 PIN X (A1 + A2) =		0,00%	283.946.244,71	=		-
						TOTAL	292.464.632,05

PT PINDAD (PERSERO)  
WS. MANAGER GENERAL AFFAIR

  
PRIONO

PERHITUNGAN KWH DIVISI SENJATA TAGIHAN BULAN FEBRUARI 2021								
NO	LOKASI METER	POSISI	STAND METER		PEMAKAIAN	FAKTOR	KWH	
			01/21	02/21				
1	PPTQF-A (LC GED. 23)	LWBP	31.101,00	31.167,60	66,60	100	6.660,00	
2	PPTQF-B (LC GED. 23)	LWBP	32.114,00	32.176,60	62,60	100	6.260,00	
3	PP GEN 1 (LC GED. 23)	LWBP	2.731,50	2.748,80	17,30	100	1.730,00	
4	PP. PAINT (LC GED. 23)	LWBP	10.248,00	10.334,40	86,40	100	8.640,00	
5	GED. 177 (LC GED. 23)	LWBP	3.302,20	3.302,20	-	100	-	
6	GED. 176 (LC GED. 23)	LWBP	4.406,00	4.443,00	37,00	100	3.700,00	
7	PPD & ER (LC GED. 23)	LWBP	34.990,00	35.024,40	34,40	100	3.440,00	
8	TF09 (LC GED. 23)	LWBP	9.633,84	9.825,08	191,24	300	57.372,00	
9	TD11 (LC GED. 23)	LWBP	4.912,47	5.248,66	336,19	300	100.857,00	
10	LC 09 GED. 23 (TD 09)	LWBP	1.816,17	1.904,00	87,83	300	26.349,00	
11	LC FNC TF 08	LWBP	10.073,46	10.281,82	208,36	300	62.508,00	
12	LC-FNC-TF 07 H	LWBP	4.199,57	4.213,14	13,57	300	4.071,00	
13	GED. 11 (380 V)	LWBP	5.854,40	5.863,85	9,45	80	756,00	
14	GED. 11 (220 V)	LWBP	3.168,85	3.195,00	26,15	80	2.092,00	
15	GED. 175 (220 V)	LWBP	8.618,30	8.620,10	1,80	80	144,00	
16	LC PERKAKAS GED. 15 (TD16)	LWBP	4.066,48	4.098,40	31,92	300	9.576,00	
17	LC GED. 110 TF 10	LWBP	111,85	123,44	11,59	300	3.477,00	
18	GED 110 (380V) MSN KOMATSU	LWBP	1.485,10	1.487,10	2,00	80	160,00	
19	LC 8A (Ex. UTC)	LWBP	1.725,92	1.750,17	24,25	300	7.275,00	
20	GD. 205 (Ex. Gudang TC)							
							JUMLAH I	297.792,00
<b>KWH PENGURANGAN</b>								
1	KOMPRESSOR GED. 38	LWBP	56,90	56,90	-	40	-	
2	PP CRANE/LOK. LC GED. 23	LWBP	14.167,80	14.191,10	23,30	100	2.330,00	
3	PPBH/LOKASI LC GED. 23	LWBP	180,60	182,15	1,55	80	124,00	
4	PP02/LOKASI LC GED. 23	LWBP	139,90	139,90	-	80	-	
5	KOMPRESSOR GED. 41 SULLAIR	WBP	337,35	738,00	400,65	100	40.065,00	
6	UPSETER 1 LC 23	LWBP	14.417,60	14.426,70	9,10	100	910,00	
7	UPSETER 2 LC 23	LWBP	27.037,40	27.038,80	1,40	100	140,00	
8	PANEL GD 23	LWBP	605,70	605,70	-	80	-	
							JUMLAH II	43.569,00
							JUMLAH TOTAL PEMAKAIAN KWH	254.223,00
PERHITUNGAN TARIF					(Rp.)		(Rp.)	
BEA PEMAKAIAN (A1) = KWH X TARIF =			254.223,00		1.116,92	=	283.946.244,71	
BEA BEBAN (A2)			0,00%		0	=	-	
BPJU = 3% X BEA PEMAKAIAN =			3,00%		283.946.244,71	=	8.518.387,34	
PENYESUAIAN = 1 PIN X (A1 + A2) =			0,00%		283.946.244,71	=	-	
							TOTAL	292.464.632,06

PT PINDAD (PERSERO)  
WS. MANAGER GENERAL AFFAIR

BRIVONO

NO	LOKASI METER	POSISI	STAND METER		PEMAKAIAN	FAKTOR X	KWH
			01/21	02/21			
1	LC FOUNDRY TD-05	LWBP	2.451,71	2.461,29	9,58	300	2.874,00
2	LC FOUNDRY TF-13	LWBP	6.486,56	6.666,09	179,53	300	53.859,00
3	LC FURNANCE GEMCO I	LWBP	15.022,30	15.060,25	37,95	470	17.836,50
4	GED. 42 G (220 V) CENTRAL	LWBP	38.546,40	38.595,90	49,50	80	3.960,00
5	GED. 42 G (380 V) CENTRAL	LWBP	18.998,70	18.998,70	-	80	-
6	FURNANCE GEMCO II	LWBP	478.341,00	480.820,00	2.479,00	50	123.950,00
7	LC GED. 42 E F (TG 26)	LWBP	4.686,24	4.775,09	88,85	300	26.655,00
8	LC TG 05 GED. 23 (TG 14)	LWBP	9.095,61	9.207,44	111,83	300	33.549,00
9	LC TG 06 GED. 23	LWBP	10.273,70	10.371,70	98,00	300	29.400,00
10	PPBH GED. 23	LWBP	180,60	182,15	1,55	100	155,00
11	GED. 26/27 (220 V) PF	LWBP	7,50	7,50	-	80	-
12	PP CRANE GED. 23	LWBP	14.167,80	14.191,10	23,30	100	2.330,00
13	PP-02 GED. 23	LWBP	139,90	139,90	-	100	-
14	GED. 23 B (220V) PF	LWBP	260,80	279,65	18,85	80	1.508,00
15	LC TG 20 (GED. 23)	LWBP	3.008,19	3.276,71	268,52	300	80.556,00
16	UP SETTER 1 LC.23	LWBP	14.417,60	14.426,70	9,10	100	910,00
17	UP SETTER 2 LC.23	LWBP	27.037,40	27.038,80	1,40	100	140,00
18	PANEL GD.23 LC.23	LWBP	605,70	632,15	26,45	80	2.116,00
19	LC GEDUNG 8C (TG 02)	LWBP	902,39	1.090,40	188,01	300	56.403,00
20	GEDUNG 8 (220V)	LWBP	2.815,60	2.816,80	1,20	80	96,00
21	PANEL GD. 42 D	LWBP	-	-	-	-	-
JUMLAH I							436.297,50
<b>KWH PENGURANGAN</b>							
1	GD. 100 KK	LWBP	7.092,30	7.116,30	24,00	80	1.920,00
		WBP	137,70	137,70	-	80	-
2	POMPA CIDURIAN	LWBP	3.730,00	3.730,00	-	80	-
		WBP	35,10	35,10	-	80	-
3	HYDRANT FOUNDRY	LWBP	97,86	97,86	-	80	-
4	PPTQ-F1-A GED. 23	LWBP	31.101,00	31.167,60	66,60	100	6.660,00
5	PPTQ-F1-B GED. 23	LWBP	32.114,00	32.176,60	62,60	100	6.260,00
6	GED. 176 (LOKASI GED. 23)	LWBP	4.406,00	4.443,00	37,00	100	3.700,00
7	GED. 177 (LOKASI GED. 23)	LWBP	3.302,20	3.302,20	-	100	-
8	PP. PAINT (LOKASI GED. 23)	LWBP	10.248,00	10.334,40	86,40	100	8.640,00
9	PPD & ER (LOKASI GED. 23)	LWBP	34.990,00	35.024,40	34,40	100	3.440,00
10	PP. GEN 1 (LOKASI GED. 23)	LWBP	2.731,50	2.748,80	17,30	100	1.730,00
11	GEDUNG 10 (DEP. ASET)	LWBP	10.606,80	10.644,70	36,10	40	1.524,00
12	EX. DIREKTORAT (GED. 3)	LWBP	27.238,00	27.355,20	117,20	80	9.376,00
JUMLAH II							43.250,00
JUMLAH TOTAL PEMAKAIAN KWH							393.047,50
<b>PERHITUNGAN TARIF</b>					(Rp.)	(Rp.)	
BEA PEMAKAIAN (A1) = KWH X TARIF =			393.047,50	1.116,92	=	439.001.827,61	
BEA BEBAN (A2)			0,00%	0	=	-	
BPJU = 3% X BEA PEMAKAIAN =			3,00%	439.001.827,61	=	13.170.054,83	
PENYESUAIAN = f PIN X (A1 + A2) =			0,00%	439.001.827,61	=	-	
TOTAL							452.171.882,43

PT PINDAD (PERSERO)  
WS. MANAGER GENERAL AFFAIR

  
PRIYONO

NO	LOKASI METER	POSISI	STAND METER		PEMAKAIAN	FAKTOR X	KWH
			01/21	02/21			
1	LC FOUNDRY TD-05	LWBP	2.451,71	2.461,29	9,58	300	2.874,00
2	LC FOUNDRY TF-13	LWBP	6.486,56	6.666,09	179,53	300	53.859,00
3	LC FURNANCE GEMCO I	LWBP	15.022,30	15.060,25	37,95	470	17.836,50
4	GED. 42 G (220 V) CENTRAL	LWBP	38.546,40	38.595,90	49,50	80	3.950,00
5	GED. 42 G (380 V) CENTRAL	LWBP	18.998,70	18.998,70	-	80	-
6	FURNANCE GEMCO II	LWBP	478.341,00	480.820,00	2.479,00	50	123.950,00
7	LC GED. 42 E F (TG 26)	LWBP	4.686,24	4.775,09	88,85	300	26.655,00
8	LC TG 05 GED. 23 (TG 14)	LWBP	9.095,61	9.207,44	111,83	300	33.549,00
9	LC TG 06 GED. 23	LWBP	10.273,70	10.371,70	96,00	300	29.400,00
10	PPBH GED. 23	LWBP	180,60	182,15	1,55	100	155,00
11	GED. 26/27 (220 V) PF	LWBP	7,50	7,50	-	80	-
12	PP CRANE GED. 23	LWBP	14.167,80	14.191,10	23,30	100	2.330,00
13	PP-02 GED. 23	LWBP	139,90	139,90	-	100	-
14	GED. 23 B (220V) PF	LWBP	260,80	279,65	16,85	80	1.508,00
15	LC TG 20 (GED. 23)	LWBP	3.008,19	3.276,71	268,52	300	80.556,00
16	UP SETTER 1 LC.23	LWBP	14.417,60	14.426,70	9,10	100	910,00
17	UP SETTER 2 LC.23	LWBP	27.037,40	27.038,80	1,40	100	140,00
18	PANEL GD 23 LC 23	LWBP	605,70	632,15	26,45	80	2.116,00
19	LC GEDUNG 9C (TG 02)	LWBP	902,39	1.090,40	188,01	300	56.403,00
20	GEDUNG 8 (220V)	LWBP	2.815,60	2.816,80	1,20	80	96,00
21	PANEL GD. 42 D	LWBP	-	-	-	-	-
JUMLAH I							436.297,50
KWH PENGURANGAN							
1	GD. 100 KK	LWBP	7.092,30	7.116,30	24,00	80	1.920,00
		WBP	137,70	137,70	-	80	-
2	POMPA CIDURIAN	LWBP	3.730,00	3.730,00	-	80	-
		WBP	35,10	35,10	-	80	-
3	HYDRANT FOUNDRY	LWBP	97,86	97,86	-	80	-
4	PPTQ-F1-A GED. 23	LWBP	31.101,00	31.167,60	66,60	100	6.660,00
5	PPTQ-F1-B GED. 23	LWBP	32.114,00	32.176,60	62,60	100	6.260,00
6	GED. 176 (LOKASI GED. 23)	LWBP	4.406,00	4.443,00	37,00	100	3.700,00
7	GED. 177 (LOKASI GED. 23)	LWBP	3.302,20	3.302,20	-	100	-
8	PP PAINT (LOKASI GED. 23)	LWBP	10.248,00	10.334,40	86,40	100	8.640,00
9	PPD & ER (LOKASI GED. 23)	LWBP	34.990,00	35.024,40	34,40	100	3.440,00
10	PP GEN 1 (LOKASI GED. 23)	LWBP	2.731,50	2.748,80	17,30	100	1.730,00
11	GEDUNG 10 (DEP. ASET)	LWBP	10.806,60	10.644,70	38,10	40	1.524,00
12	EX. DIREKTORAT (GED. 3)	LWBP	27.238,00	27.355,20	117,20	80	9.376,00
JUMLAH II							43.250,00
JUMLAH TOTAL PEMAKAIAN KWH							393.047,50
PERHITUNGAN TARIF					(Rp.)		(Rp.)
BEA PEMAKAIAN (A1) = KWH X TARIF =			393.047,50	1.116,92	=	439.001.827,61	
BEA BEBAN (A2)			0,00%	0	=	-	
BPJU = 3% X BEA PEMAKAIAN =			3,00%	439.001.827,61	=	13.170.054,83	
PENYESUAIAN = 1 PIN X (A1 + A2) =			0,00%	439.001.827,61	=	-	
TOTAL							452.171.882,43

PT PINDAD (PERSERO)  
WS. MANAGER GENERAL AFFAIR

  
PRIYONO

OPPO A91 · ©kanjeng putri  
2021/10/15 16:09

## Lampiran 2 Hasil perhitungan PVsyst



# PVsyst - Simulation report

## Grid-Connected System

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Project: pindad

Variant: **New simulation**  
variant **No 3D scene defined,**  
**no shadings**

**System power: 931 kWp**

Cidurian - Indonesia

| **Author**

### Project summary

<b>Geographical Site</b>	<b>Situation</b>	<b>Project settings</b>
<b>Cidurian</b>	Latitude	Albedo
Indonesia	Longitude	0.20
	Altitude	
	Time zone	
<b>Metadata</b>		
Cidurian		
Meteonorm 8.0 (2014), 100% monthly		

### System summary

<b>Grid-Connected System</b>	<b>No 3D scene defined, no shadings Near</b>	
<b>PV Field Orientation</b>	<b>Shadings</b>	<b>User's needs</b>
Fixed plane	No Shadings	Unlimited load (grid)
Tilt/Azimuth		
30 / 0 °		
<b>System information</b>		
<b>PV Array</b>	<b>Inverters</b>	
Nb. of modules	Nb. of units	25 units
Pnom total	Pnom total	750 kWac
	Pnom ratio	1.241

### Results summary

Produced Energy	1362 MWh/year	Specific production	1464 kWh/kWp/year	Perf. Ratio PR	80.66 %
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### Table of contents

Project and results summary	2
General parameters, PV Array Characteristics, System losses	3
Main results	4
Loss diagram	5
Special graphs	6

### General parameters

#### Grid-Connected System

No 3D scene defined, no shadings

#### PV Field Orientation

##### Orientation

Fixed plane

Tilt/Azimuth 30 / 0°

##### Sheds configuration

No 3D scene defined

##### Models used

Transposition Perez

Diffuse Perez, Meteororr

Circumsolar separate

##### Horizon

Free Horizon

##### Near Shadings

No Shadings

##### User's needs

Unlimited load (grid)

### PV Array Characteristics

#### PV module

Manufacturer

Generic

Model

Mono 440 Wp 72 cells bifacial

(Original PVsvst database)

Unit Nom. Power

440 Wp

Number of PV modules

2115 units

Nominal (STC)

931 kWp

Modules

141 Strings x 15 In series

#### At operating cond. (50°C)

P<sub>mp</sub>

845 kW<sub>p</sub>

U<sub>mpp</sub>

562 V

I<sub>mpp</sub>

1504 A

#### Total PV power

Nominal (STC) Total

931 kWp

Module area

2115 modules

Cell area

4741 m<sup>2</sup>

2101 m<sup>2</sup>

#### Inverter

Manufacturer

Generic

Model

30 kWac inverter

(Original PVsvst database)

Unit Nom. Power

30.0 kWac

Number of inverters

25 units

Total power

750 kWac

Operating voltage

450-700 V

P<sub>nom</sub> ratio (DC:AC)

1.24

#### Total inverter power

Total power Nb.

750 kWac

of inverters

25 units

P<sub>nom</sub> ratio

1.24

### Array losses

#### Thermal Loss factor

Module temperature according to irradiance

U<sub>c</sub> (const)

20.0 W/m<sup>2</sup>K

U<sub>v</sub> (wind)

0.0 W/m<sup>2</sup>K/m/s

#### DC wiring losses

Global array res.

6.3 mΩ

Loss Fraction

1.5 % at STC

#### Module Quality Loss

Loss Fraction

-0.4 %

#### Module mismatch losses

Loss Fraction

2.0 % at MPP

#### Strings Mismatch loss

Loss Fraction

0.1 %

#### IAM loss factor

Incidence effect (IAM): Fresnel AR coating, n(glass)=1.526, n(AR)=1.290

0°	30°	50°	60°	70°	75°	80°	85°	90°
1.000	0.999	0.987	0.962	0.892	0.816	0.681	0.440	0.000

Main results

System Production

Produced Energy

1362 MWh/year

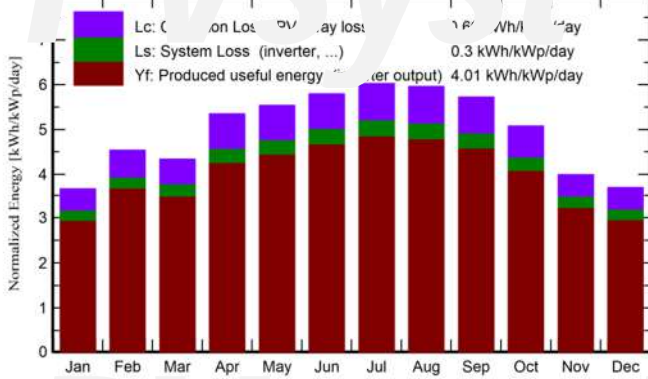
Specific production

1464 kWh/kWp/year

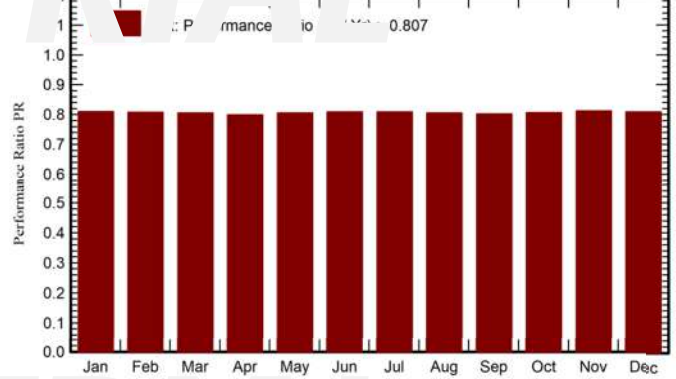
Performance Ratio PR

80.66 %

Normalized productions (per installed kWp)



Performance Ratio PR



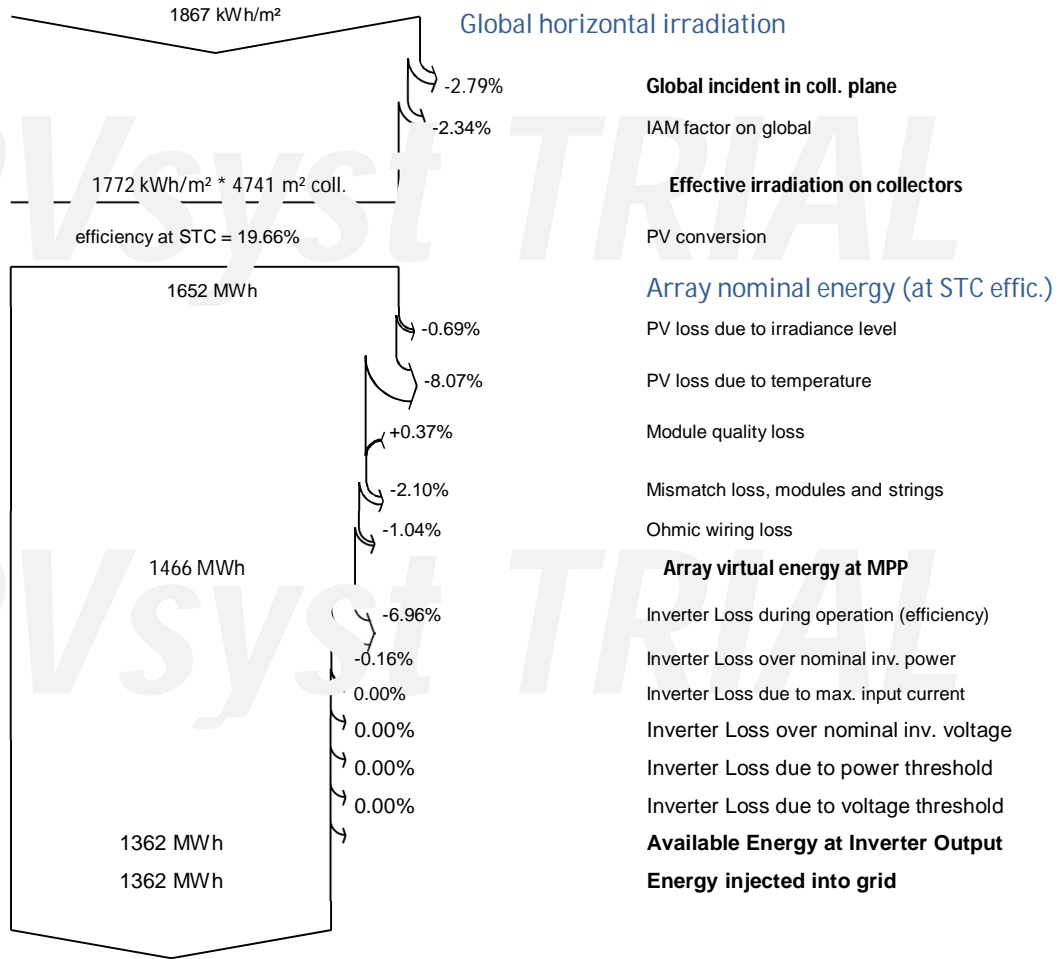
Balances and main results

	GlobHor kWh/m <sup>2</sup>	DiffHor kWh/m <sup>2</sup>	T_Amb °C	GlobInc kWh/m <sup>2</sup>	GlobEff kWh/m <sup>2</sup>	EArray MWh	E_Grid MWh	PR ratio
January	142.4	77.82	20.33	112.9	108.6	91.9	85.1	0.810
February	151.2	70.05	20.07	127.1	122.8	102.9	95.6	0.808
March	144.3	76.13	20.74	134.4	130.9	108.6	100.8	0.806
April	154.8	64.96	20.95	160.4	157.3	128.2	119.3	0.799
May	150.9	66.75	21.47	171.6	168.8	138.0	128.6	0.805
June	146.9	59.59	20.91	173.9	171.6	140.6	131.0	0.810
July	159.8	61.71	20.73	186.7	184.3	150.8	140.5	0.809
August	169.0	68.48	20.93	184.8	182.1	148.8	138.6	0.806
September	174.1	70.52	20.90	171.6	168.0	137.7	128.2	0.803
October	179.2	85.33	21.46	157.5	153.0	126.9	118.2	0.807
November	146.8	85.64	20.84	119.8	115.5	97.4	90.5	0.812
December	147.2	78.30	20.70	113.8	109.2	92.4	85.7	0.809
Year	1866.6	865.27	20.84	1814.6	1772.1	1464.2	1362.1	0.807

Legends

- GlobHor Global horizontal irradiation
- DiffHor Horizontal diffuse irradiation
- T\_Amb Ambient Temperature Global
- GlobInc incident in coll. plane
- GlobEff Effective Global, corr. for IAM and shadings
- EArray Effective energy at the output of the array
- E\_Grid Energy injected into grid
- PR Performance Ratio

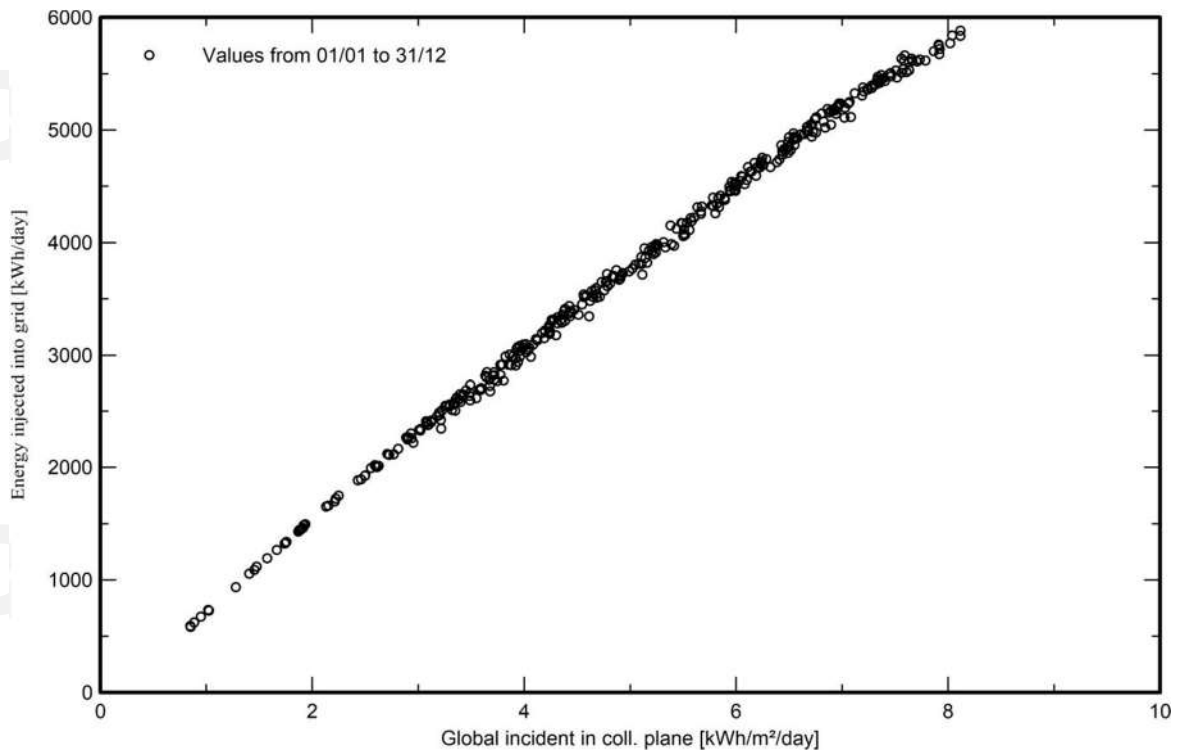
**Loss diagram**



PVsyst TRIAL PVsyst TRIAL

## Special graphs

### Daily Input/Output diagram



### System Output Power Distribution

