Scenario — PV
GEMINI-60-house-part-of-a-settlement Indonesia - Timika -4.534, 136.867

Name	Slope °	Azimuth °	Wp	Wall d/h m	Face	Bifacial	Wp counted
Roof East	22	-90	19800	—	front	—	yes
Roof West	22	90	19800	—	front	—	yes
Terrace railing south	90	0	4620	5 / 4	front	—	yes
Terrace railing north	90	180	4620	5 / 4	front	—	yes
share central structure east part	8	-90	20460	—	front	—	yes
share central strucure west part	8	90	20460	—	front	—	yes
Total counted			89760				

Location: Great example for tropical rainforest climate
Database PVGIS-ERA5 2005–2023 loss 14 % azimuth 0 = south, 90 = west, −90 = east.
Price bands and charts use UTC+9 from longitude (15° per hour), not the political time zone.
Peak hour 2019-03-21 12:30 local (03:30 UTC) 59481 W 0.663 W/Wp of 89760 Wp.
Database gaps: 0 days with 0 yield while the sun reached the horizon at noon. Yield charts skip them. The simulation uses the lowest-yield day of that month.
Sell when the export price is above 0. At 0 cent export PV yield only, not the battery. Do not sell when the earning is negative. At 15:00 winter time, battery export is only the kWh that would not fit in the next 72 h.

Scenario — house, heat pump, battery
GEMINI-60-house-part-of-a-settlement Indonesia - Timika -4.534, 136.867

Chapter	Parameter	Value
Building	Design out / in / heat	-10.0 °C / 20.0 °C / 1600.0 W
	Heat on / cool on / ground	22.0 °C / 25.0 °C / 10.0 °C
	Curve / flow min / max	0.4 / 25.0 °C / 55.0 °C
	Thermal mass of the house	25.0 kWh/K
	Household only	4.0 kWh/day
DHW	Litres at 40 °C / tank	200.0 L tank 42.0 °C 8–18 h
	Water out of the pipe Q1–Q4	26 °C 26 °C 25 °C 26 °C
Heat pump	Source	air and ground
	COP −10/0/10 @ 35 °C	2.4 3.4 4.5
	COP −10/0/10 @ 50 °C	1.9 2.6 3.3
	kW −10/0/10 @ 35 °C	4 5 6
	kW −10/0/10 @ 50 °C	3.5 4.5 5
Battery	kWh / C-rate / SOC min–max–start	257.2 kWh C 0.5 5 / 95 / 50 %
	Nameplate	—
	Charge / discharge η	95 % / 90 %
Grid	Inverter / grid connection	54.0 kW / 27.0 kW
	Max export	27.0 kW
	Import cap Jan–Jun kW	Jan 2 Feb 2 Mar 2 Apr 2 May 2 Jun 2
	Import cap Jul–Dec kW	Jul 2 Aug 2 Sep 2 Oct 2 Nov 2 Dec 2
Cars	Lunch DC / night AC	0.0 kWh @ 100.0 kW night 10.0 kWh @ 11.0 kW

Clock is winter time UTC+1. Emergency import is an hour above the monthly kW cap.

Records 1–10 — contribution of each PV
Indonesia - Timika -4.534, 136.867

PV	2019-03-21 03:30	2015-03-14 02:30	2014-02-09 03:30	2015-03-13 02:30	2019-03-20 03:30	2011-02-18 03:30	2014-02-09 02:30	2019-03-20 02:30	2023-10-25 02:30	2012-10-01 02:30
Roof East	13383	14567	13341	14530	13311	13307	14396	14405	13806	13909
Roof West	14621	13249	14260	13203	14524	14199	12945	13153	13565	13479
Terrace railing south	515	764	1508	784	534	1310	1510	539	1340	860
Terrace railing north	532	538	92	525	513	99	102	531	136	588
share central structure east part	14984	15332	14811	15290	14894	14741	15111	15197	14877	14879
share central strucure west part	15446	14838	15153	14793	15346	15072	14571	14730	14787	14719
Watt at record	59481	59287	59165	59125	59121	58727	58634	58556	58510	58433
Percent of installed peak	66.3	66.1	65.9	65.9	65.9	65.4	65.3	65.2	65.2	65.1

Values are watts at that hour. Date and time are UTC. Record 59481 W (66.3 % of 89760 Wp).

Hours at or above a share of the record
Indonesia - Timika -4.534, 136.867

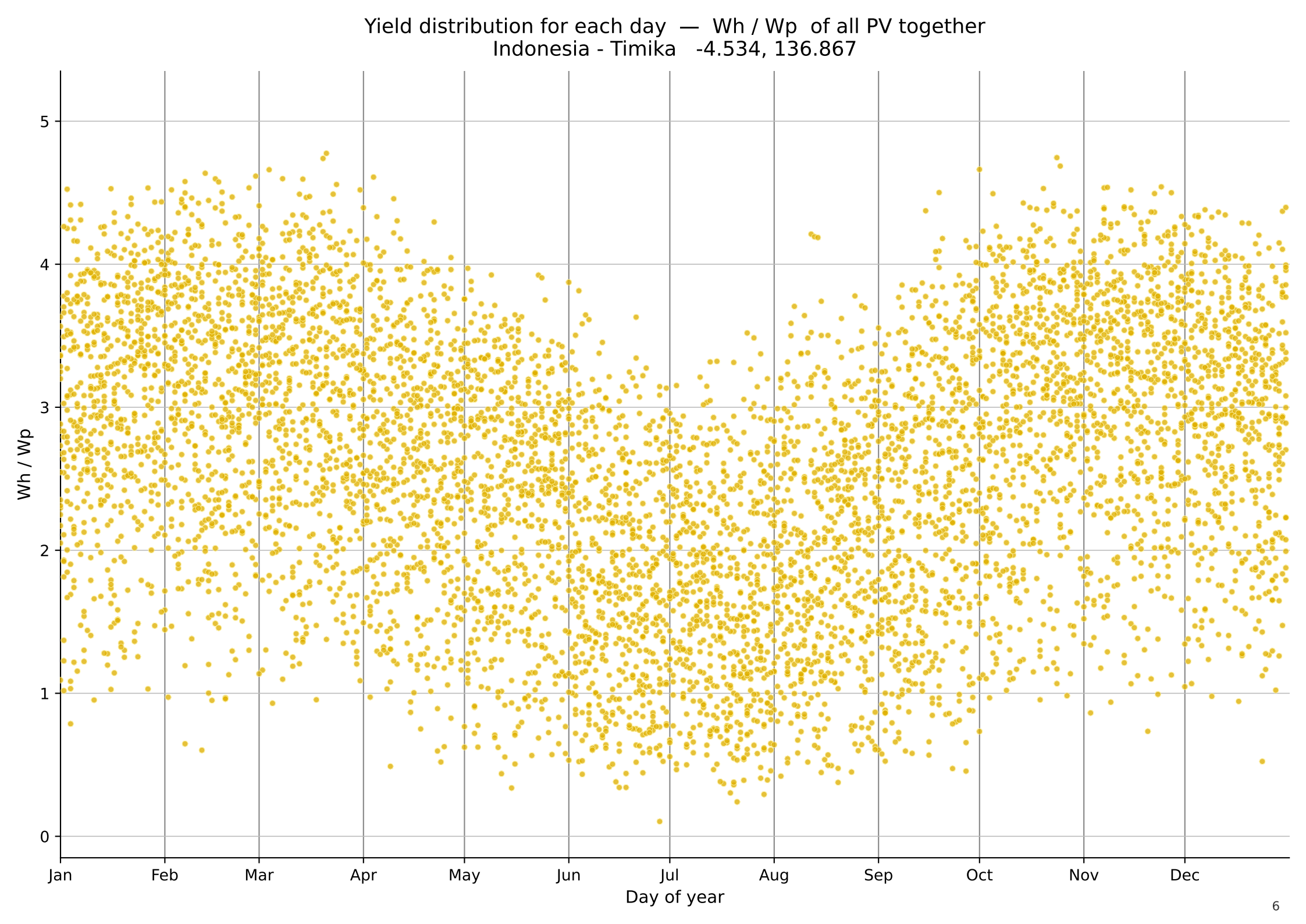
Of the record	Hours	Watts
98 %	11	58291 W
96 %	67	57101 W
94 %	165	55912 W
92 %	355	54722 W
90 %	590	53533 W

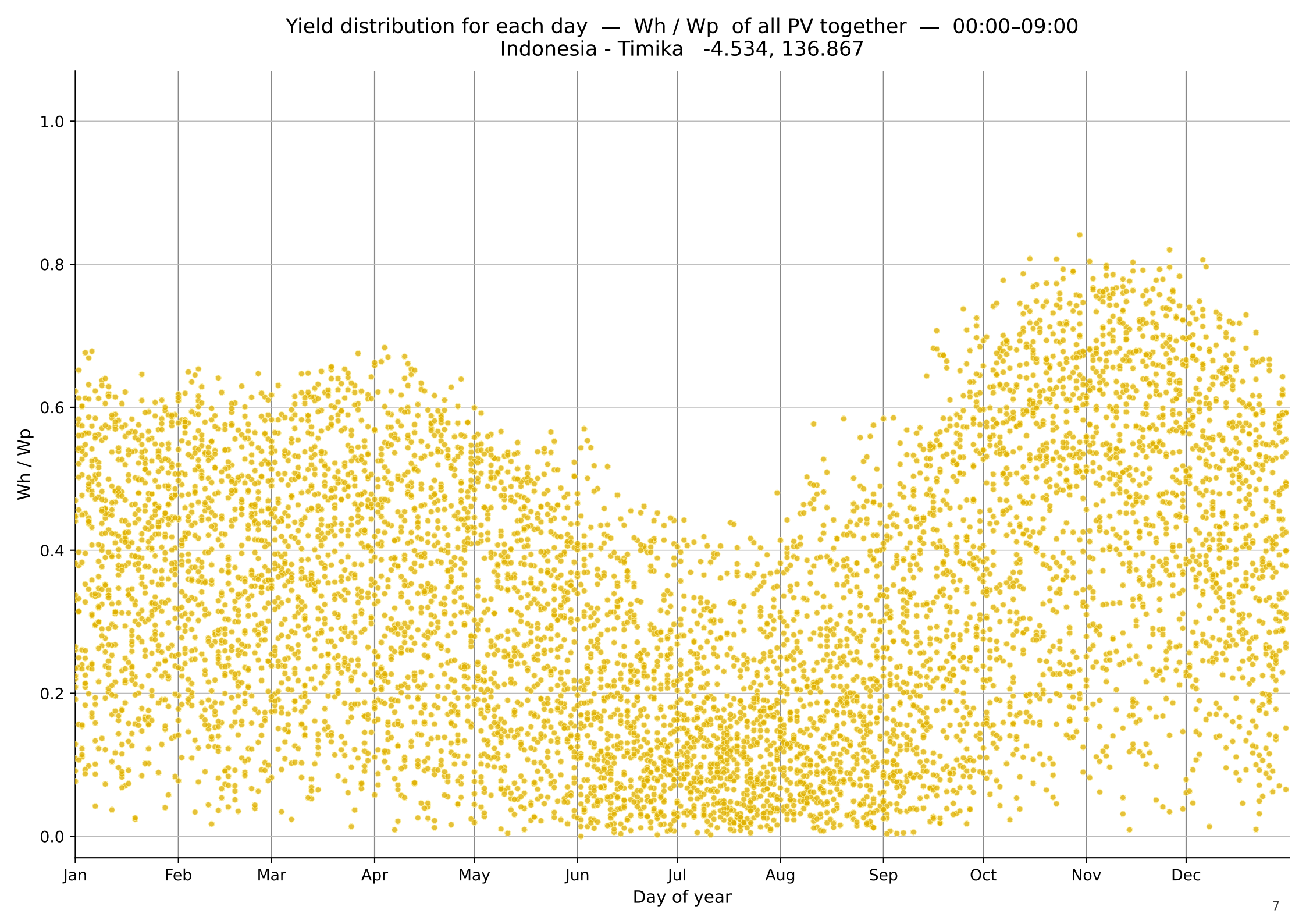
Record hour = 59481 W combined.

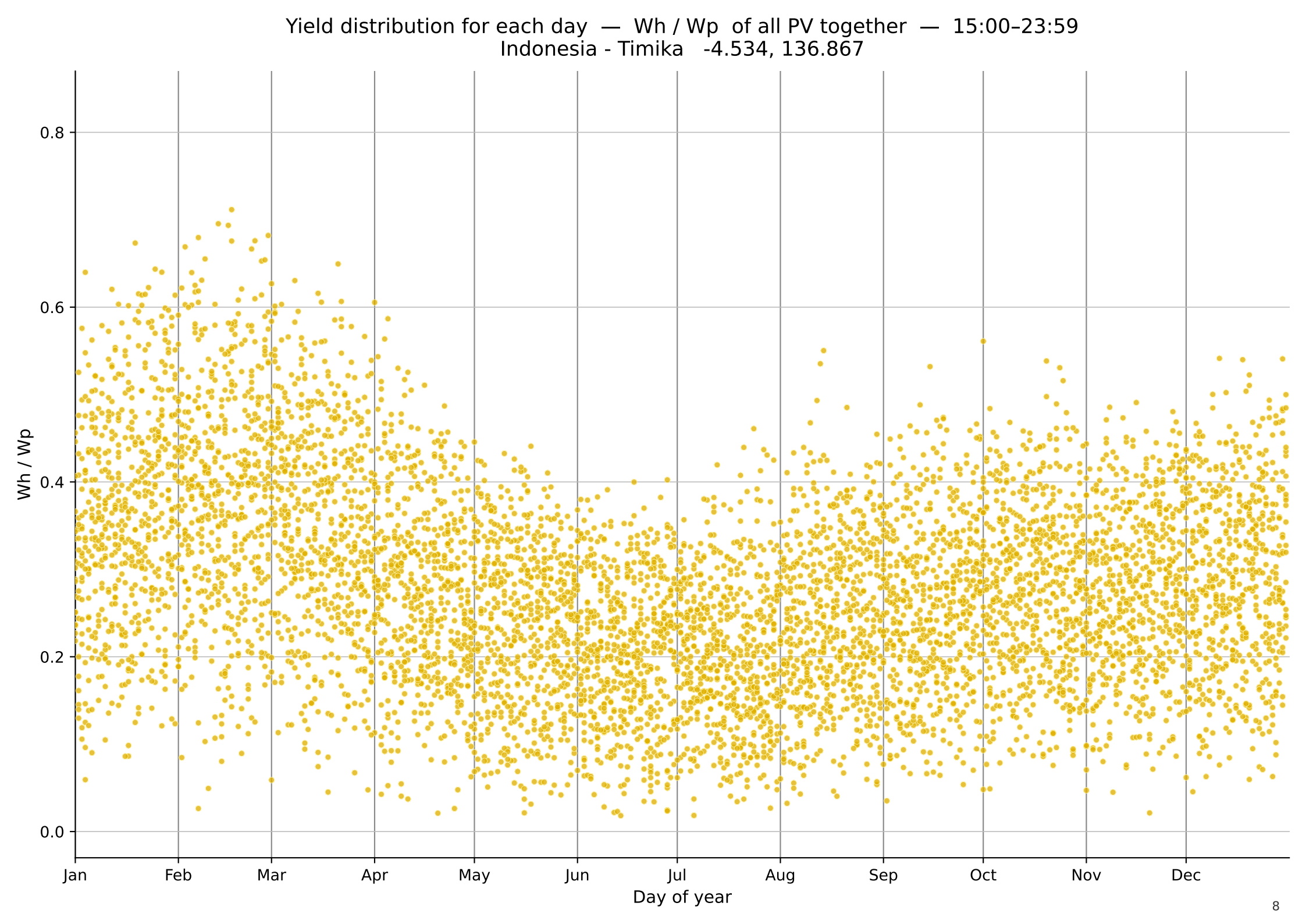
Records of each photovoltaic field
Indonesia - Timika -4.534, 136.867

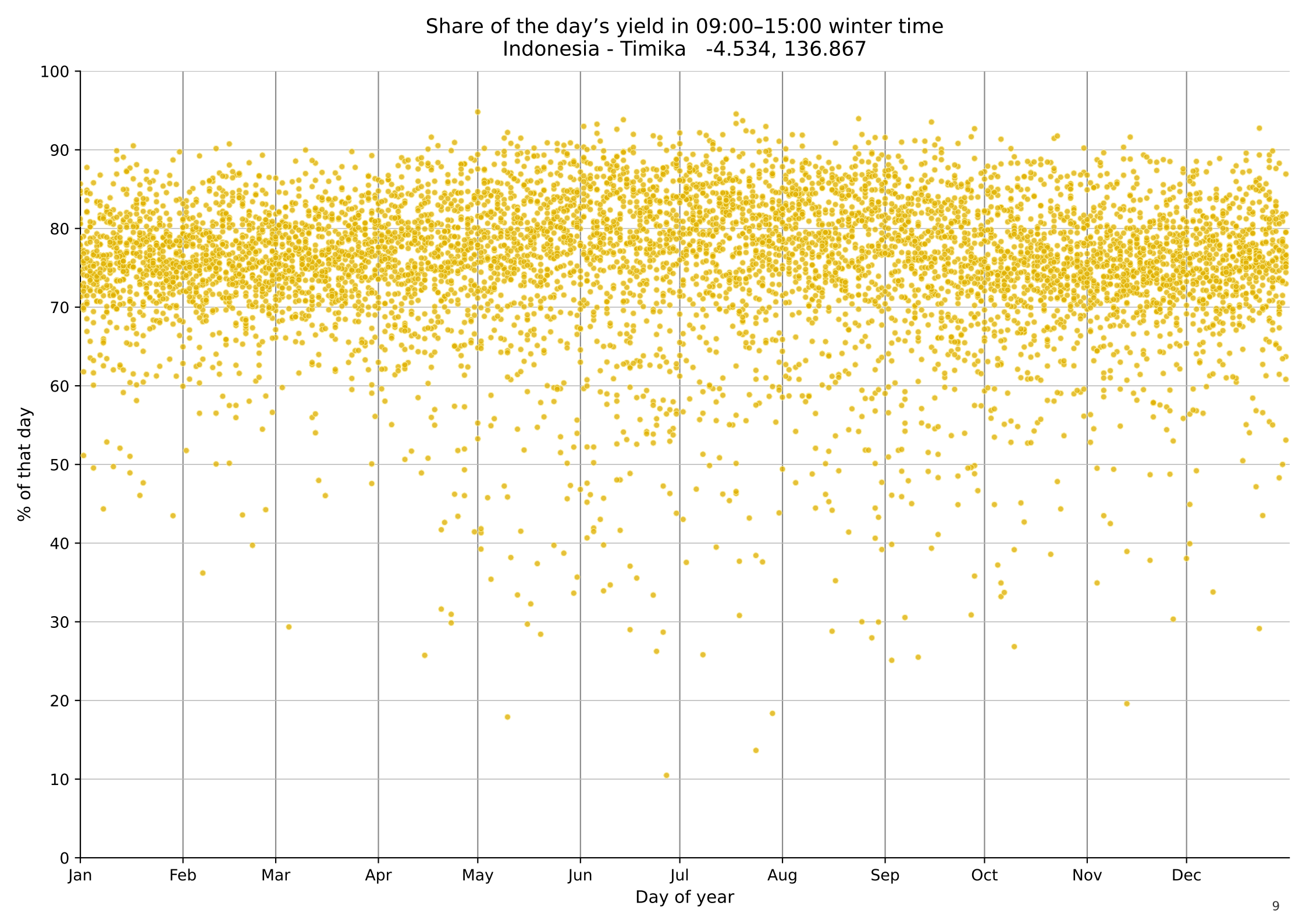
PV	Date	Watts	%	h ≥98%	h ≥96%	h ≥94%	h ≥92%	h ≥90%
Roof East	2015-03-13 01:30	14775	74.6	7	43	107	244	429
Roof West	2019-03-20 04:30	14913	75.3	6	17	47	122	254
Terrace railing south	2020-12-20 02:30	2038	44.1	11	34	71	148	267
Terrace railing north	2022-06-21 02:30	1879	40.7	3	7	21	30	58
share central structure east part	2015-03-14 02:30	15332	74.9	6	34	100	248	429
share central strucure west part	2019-03-21 03:30	15446	75.5	3	20	64	150	339

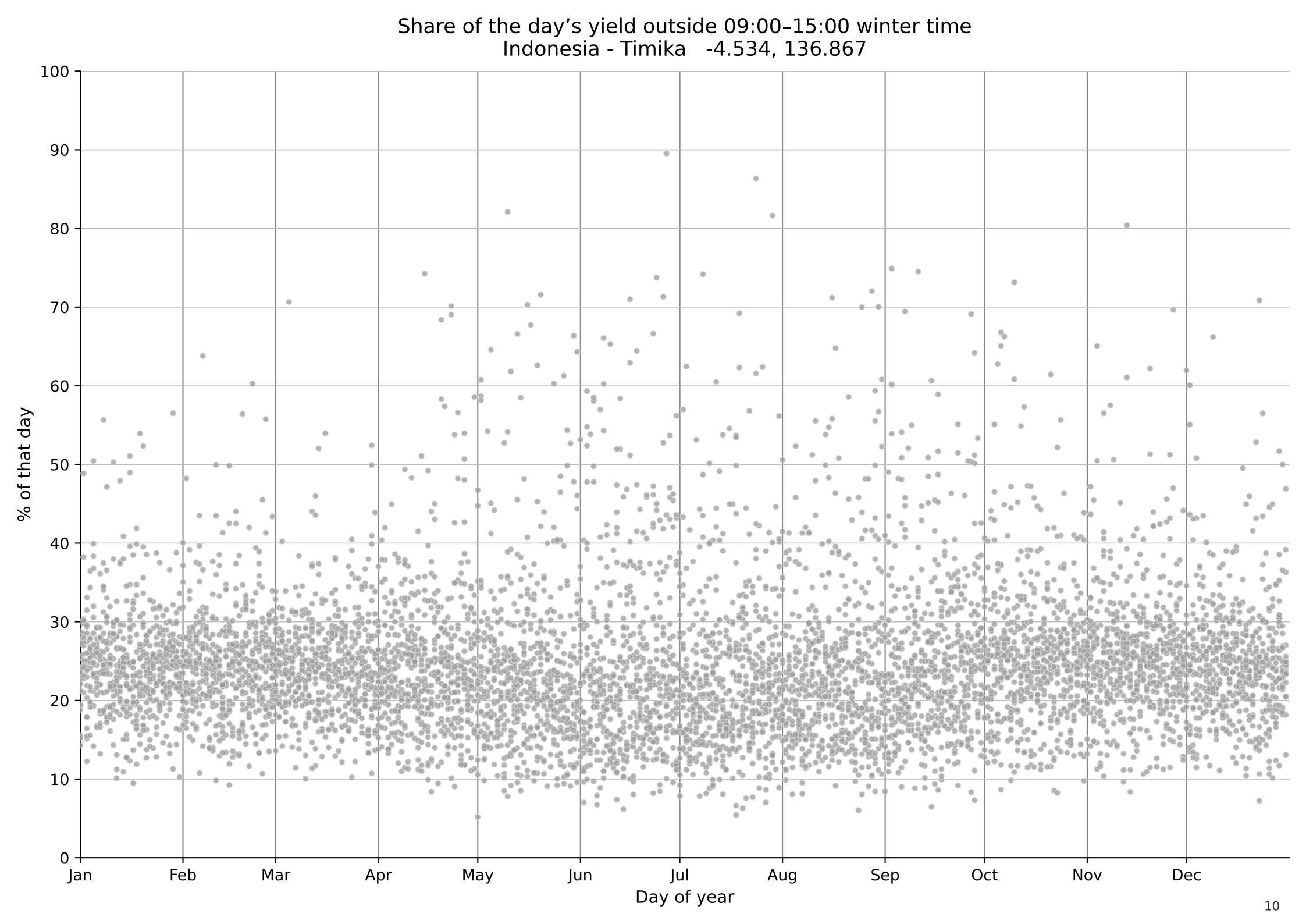
Watts is the highest hour of that field. % is of its own Wp. Hours are the count of hours at or above that share of its own record. Use this to size the MPPT or the inverter for that field.

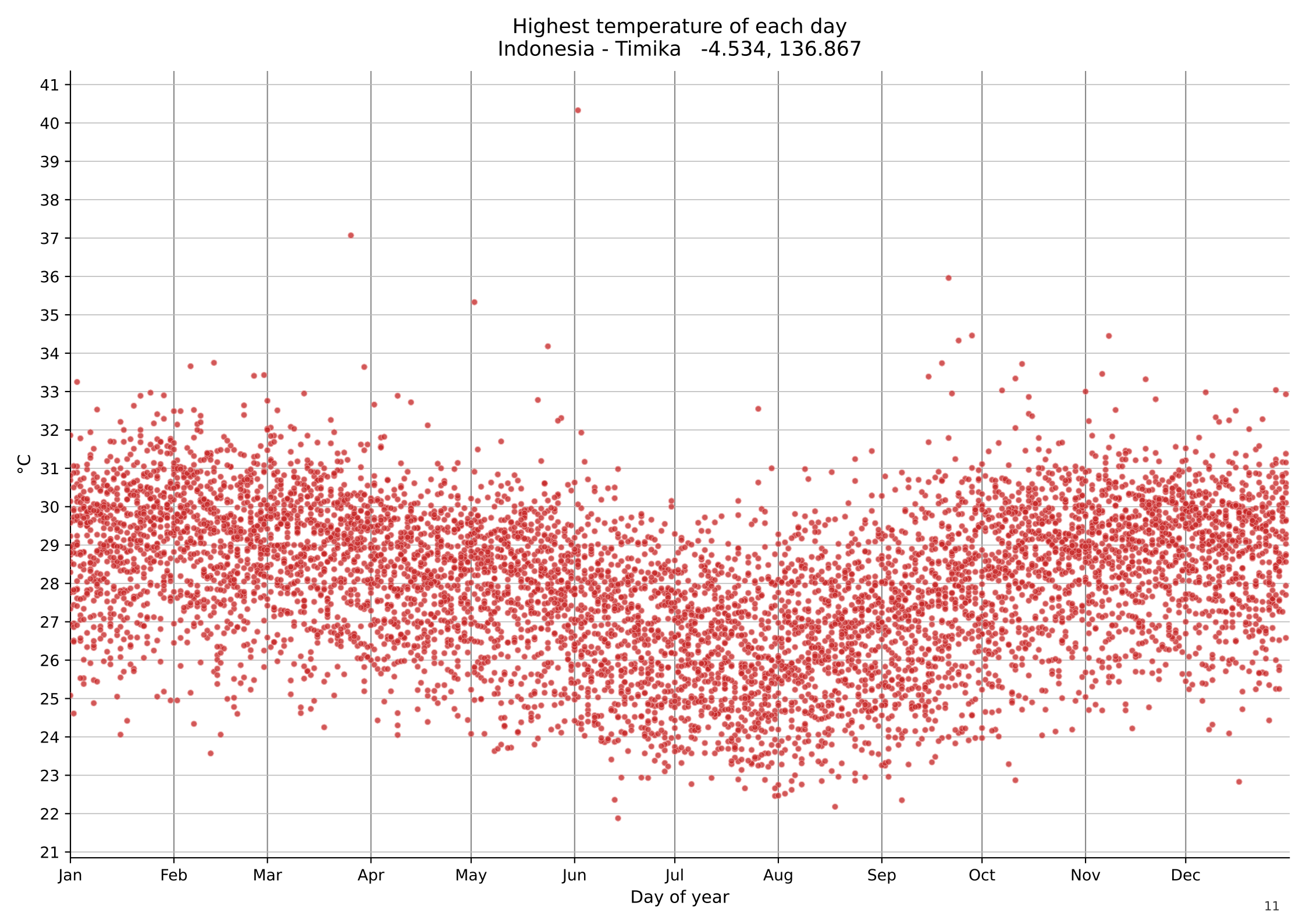

Yield distribution for each day — Wh / Wp of all PV together
Indonesia - Timika -4.534, 136.867
Wh / Wp
0
1
2
3
4
5
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year

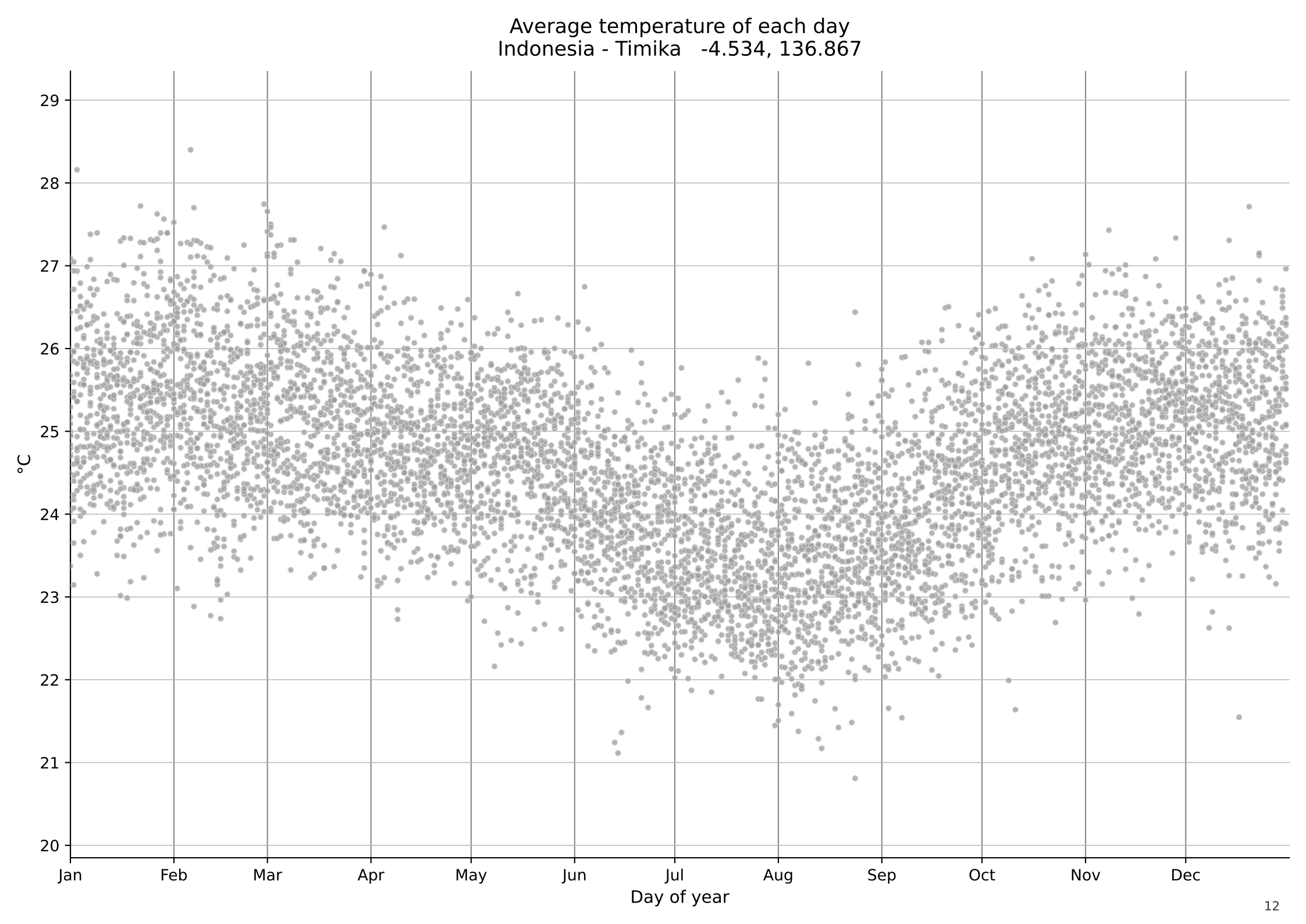

Yield distribution for each day — Wh / Wp of all PV together — 00:00–09:00
Indonesia - Timika -4.534, 136.867
1.0
0.8
0.6
0.4
0.2
0.0
Wh / Wp
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year

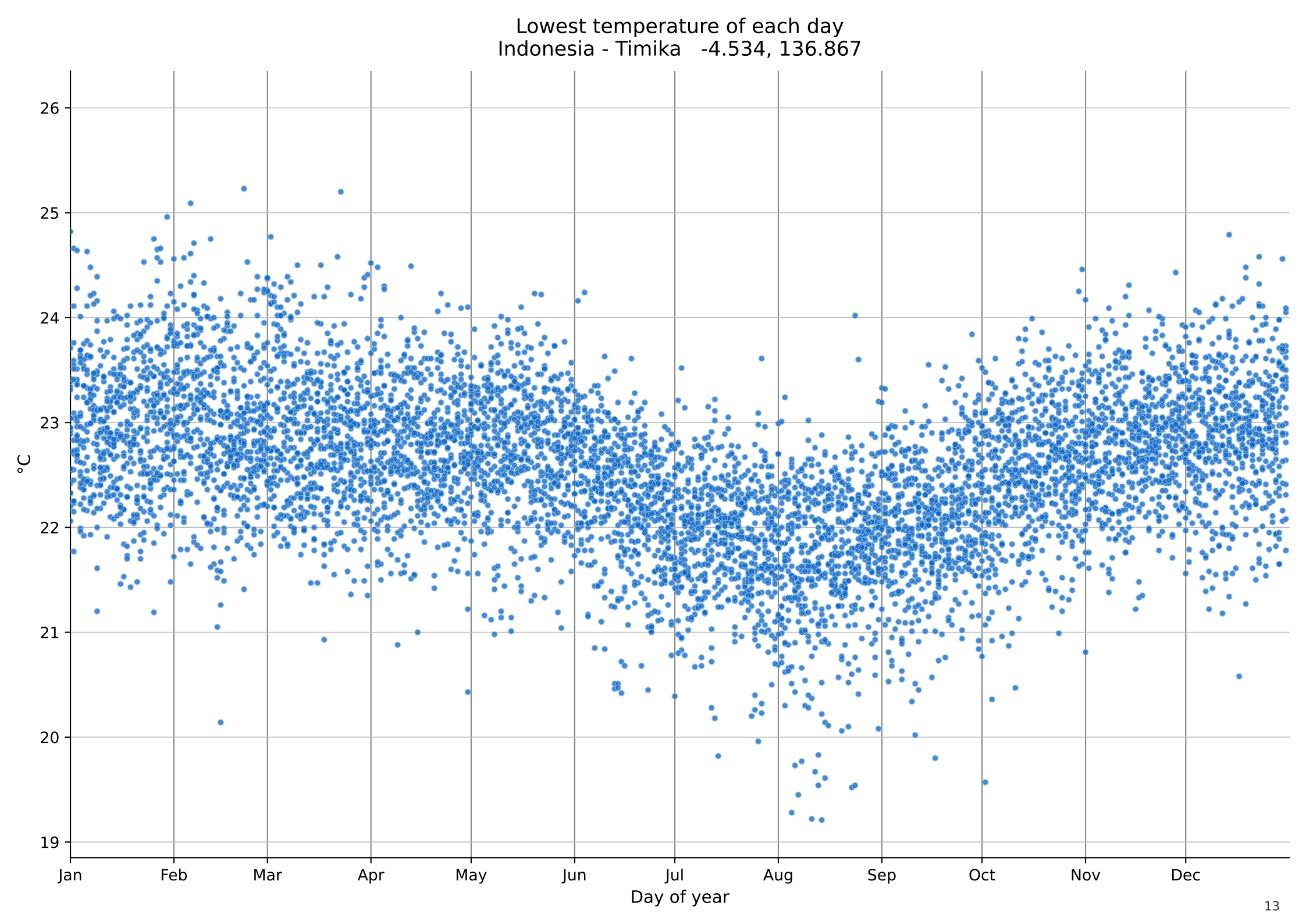

Yield distribution for each day — Wh / Wp of all PV together — 15:00–23:59
Indonesia - Timika -4.534, 136.867
Wh / Wp
0.0
0.2
0.4
0.6
0.8
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year

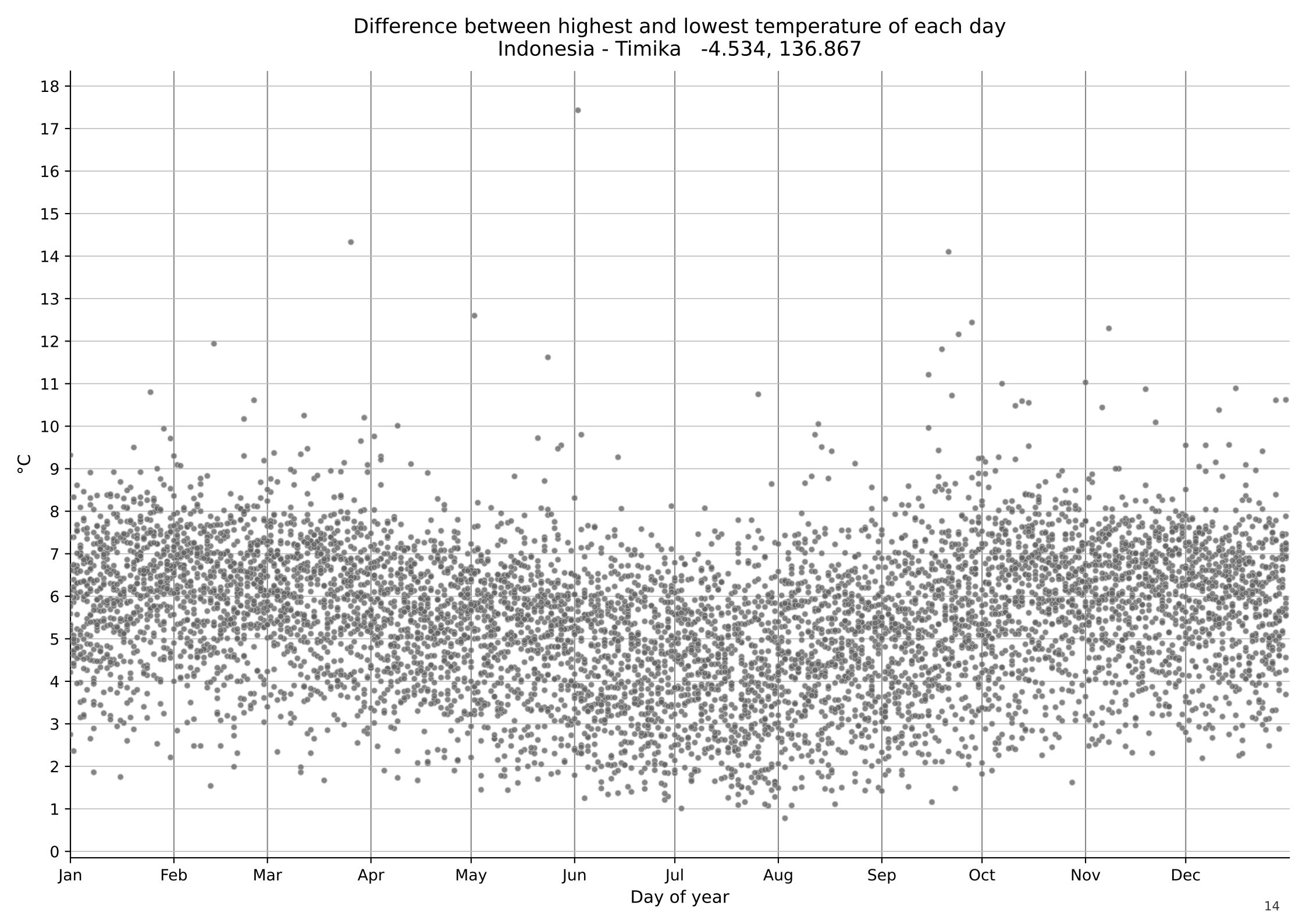

Share of the day’s yield in 09:00–15:00 winter time
Indonesia - Timika -4.534, 136.867
% of that day
Day of year
0
10
20
30
40
50
60
70
80
90
100
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Share of the day’s yield outside 09:00–15:00 winter time
Indonesia - Timika -4.534, 136.867
% of that day
Day of year
0
10
20
30
40
50
60
70
80
90
100
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Highest temperature of each day
Indonesia - Timika -4.534, 136.867
°C
41
40
39
38
37
36
35
34
33
32
31
30
29
28
27
26
25
24
23
22
21
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year


Average temperature of each day
Indonesia - Timika -4.534, 136.867
°C
29
28
27
26
25
24
23
22
21
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year


Lowest temperature of each day
Indonesia - Timika -4.534, 136.867
°C
26
25
24
23
22
21
20
19
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year


Difference between highest and lowest temperature of each day
Indonesia - Timika -4.534, 136.867
°C
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year

Monthly and yearly specific yield (kWh/kWp = Wh/Wp)
Indonesia - Timika -4.534, 136.867

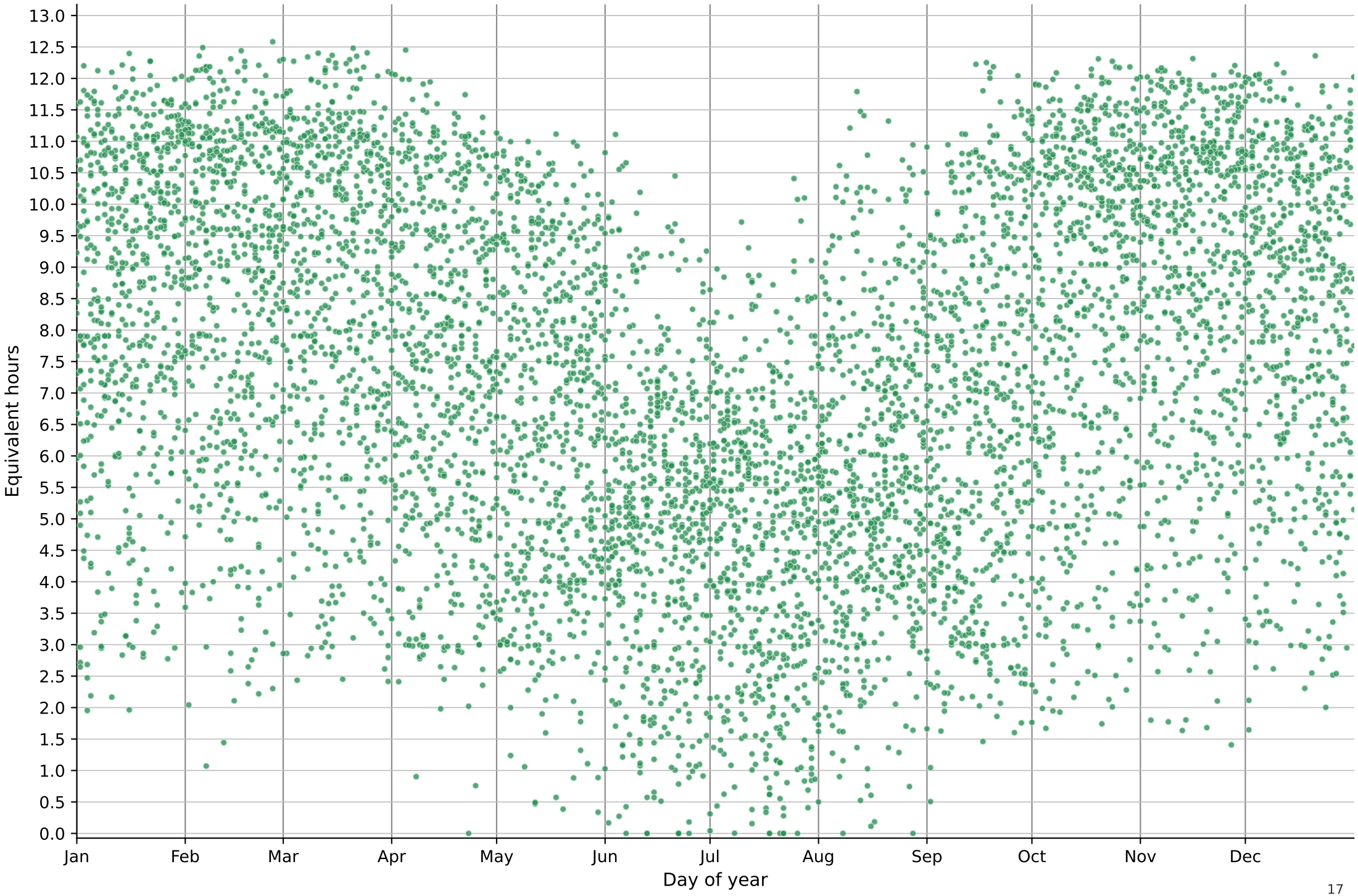
Month / year		Roof East 22°/-90° 19800 Wp	Roof West 22°/90° 19800 Wp	Terrace railing south 90°/0° 4620 Wp	Terrace railing north 90°/180° 4620 Wp	share central structure east 8°/-90° 20460 Wp	share central strucure west p 8°/90° 20460 Wp	All together
January	Maximum	117.72	112.03	62.27	18.94	120.54	118.31	109.26
	average	100.33	97.41	52.96	17.34	103.08	101.94	93.97
	minimum	86.81	86.01	45.55	15.38	89.36	89.13	82.03
February	Maximum	112.36	106.53	54.72	17.64	114.73	112.38	103.57
	average	93.12	90.00	47.67	16.31	95.40	94.18	86.90
	minimum	79.26	76.58	41.32	13.58	81.23	80.19	74.11
March	Maximum	116.45	110.62	36.52	29.55	118.72	116.46	107.10
	average	101.39	97.49	33.72	27.07	103.70	102.18	93.93
	minimum	89.35	84.25	30.02	25.56	91.32	88.92	82.60
April	Maximum	96.42	91.96	16.53	42.36	97.89	95.65	88.39
	average	85.36	82.85	15.09	38.33	87.47	86.44	79.50
	minimum	69.87	68.19	14.08	31.48	71.66	70.99	65.32
May	Maximum	90.66	88.73	13.69	46.54	93.17	92.32	84.95
	average	77.08	77.07	12.92	39.66	79.66	79.58	73.01
	minimum	64.72	64.71	11.66	33.35	66.98	66.89	61.38
June	Maximum	82.31	79.90	12.25	46.17	84.18	83.22	76.92
	average	56.88	58.75	11.23	32.81	59.28	60.01	54.96
	minimum	45.40	46.27	10.23	25.97	47.13	47.46	43.65
July	Maximum	62.16	65.79	12.72	34.73	65.15	66.60	60.66
	average	53.93	56.65	11.75	30.31	56.54	57.60	52.58
	minimum	40.88	44.47	9.84	23.21	43.68	45.23	41.16
August	Maximum	86.29	86.14	14.39	40.94	89.14	89.06	81.50
	average	64.81	66.99	13.40	31.91	67.61	68.46	62.42
	minimum	51.62	56.61	12.03	26.80	55.39	57.05	51.78
September	Maximum	92.58	93.81	23.34	31.74	96.16	96.52	87.83
	average	74.74	76.00	21.24	28.00	77.68	78.10	71.30
	minimum	55.67	58.16	18.60	24.01	58.31	59.24	54.13
October	Maximum	111.15	112.03	50.85	18.11	115.29	115.49	105.35
	average	97.25	97.24	44.35	17.08	100.69	100.54	91.93
	minimum	86.42	84.42	39.89	15.58	88.96	88.07	80.95
November	Maximum	111.08	108.83	61.07	18.20	114.04	112.67	103.62
	average	98.67	96.60	54.48	16.05	101.64	100.67	92.82
	minimum	86.40	87.39	48.26	14.20	89.80	90.14	82.71
December	Maximum	108.05	102.11	60.92	18.61	110.36	107.88	100.09
	average	97.05	94.25	55.43	16.81	99.72	98.52	91.11
	minimum	83.47	82.39	48.14	15.27	86.20	85.70	79.13
All years	Maximum	1077.2	1061.9	390.8	331.8	1108.8	1102.2	1013.0
	average	1000.6	991.3	374.3	311.7	1032.5	1028.2	944.4
	minimum	921.6	919.0	354.8	292.4	952.7	951.1	873.6

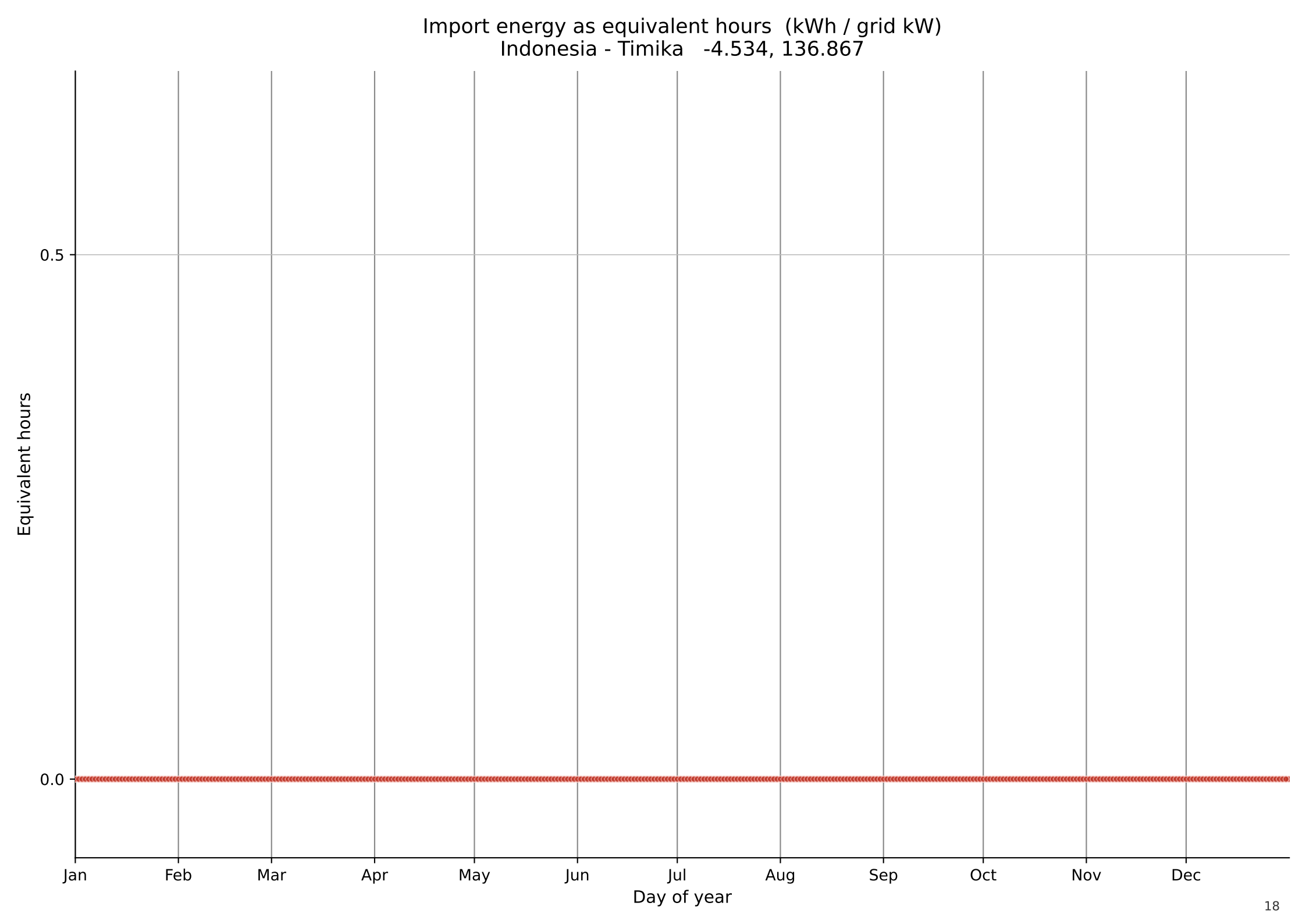
Highest combined yield hour: 2019-03-21 03:30 UTC 59480.7 W (0.663 W/Wp) of 89760 Wp installed. Use this hour to size battery charge power.

Monthly and yearly total yield (kWh)
Indonesia - Timika -4.534, 136.867

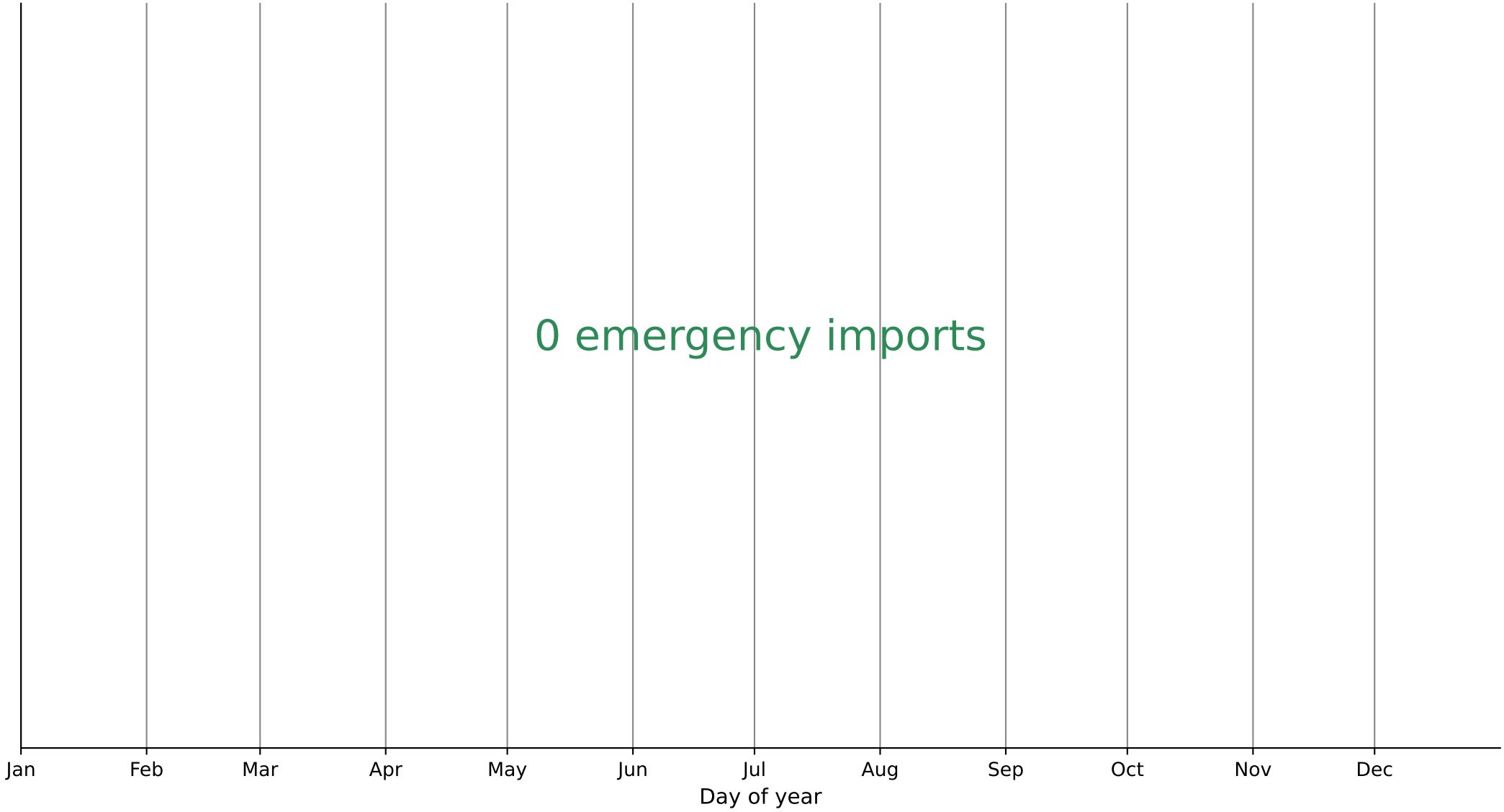
Month / year		Roof East 22°/-90° 19800 Wp	Roof West 22°/90° 19800 Wp	Terrace railing south 90°/0° 4620 Wp	Terrace railing north 90°/180° 4620 Wp	share central structure east p 8°/-90° 20460 Wp	share central strucure west p 8°/90° 20460 Wp	All together
January	Maximum	2330.8	2218.2	287.7	87.5	2466.3	2420.6	9806.8
	average	1986.6	1928.6	244.7	80.1	2109.1	2085.8	8435.0
	minimum	1718.8	1703.0	210.4	71.0	1828.3	1823.6	7363.3
February	Maximum	2224.7	2109.2	252.8	81.5	2347.3	2299.3	9296.1
	average	1843.8	1781.9	220.3	75.3	1951.9	1926.9	7800.1
	minimum	1569.4	1516.2	190.9	62.7	1661.9	1640.6	6652.5
March	Maximum	2305.7	2190.3	168.7	136.5	2428.9	2382.9	9613.0
	average	2007.6	1930.3	155.8	125.1	2121.8	2090.5	8431.0
	minimum	1769.0	1668.2	138.7	118.1	1868.5	1819.2	7414.4
April	Maximum	1909.2	1820.8	76.4	195.7	2002.9	1956.9	7933.7
	average	1690.1	1640.5	69.7	177.1	1789.6	1768.6	7135.6
	minimum	1383.5	1350.1	65.0	145.4	1466.3	1452.4	5863.2
May	Maximum	1795.0	1756.9	63.3	215.0	1906.3	1888.9	7625.1
	average	1526.3	1526.0	59.7	183.2	1629.9	1628.2	6553.3
	minimum	1281.5	1281.3	53.8	154.1	1370.3	1368.6	5509.7
June	Maximum	1629.7	1582.0	56.6	213.3	1722.3	1702.8	6904.8
	average	1126.2	1163.3	51.9	151.6	1212.9	1227.8	4933.7
	minimum	898.8	916.2	47.3	120.0	964.3	971.1	3918.2
July	Maximum	1230.7	1302.7	58.8	160.4	1333.0	1362.6	5444.6
	average	1067.9	1121.7	54.3	140.0	1156.8	1178.5	4719.3
	minimum	809.5	880.6	45.5	107.2	893.7	925.4	3694.8
August	Maximum	1708.5	1705.5	66.5	189.2	1823.8	1822.1	7315.3
	average	1283.2	1326.4	61.9	147.4	1383.3	1400.6	5602.8
	minimum	1022.1	1120.8	55.6	123.8	1133.3	1167.3	4647.8
September	Maximum	1833.0	1857.5	107.8	146.6	1967.4	1974.7	7883.6
	average	1479.9	1504.7	98.1	129.4	1589.4	1597.9	6399.4
	minimum	1102.2	1151.6	85.9	110.9	1193.1	1212.0	4859.1
October	Maximum	2200.7	2218.2	234.9	83.7	2358.8	2362.9	9456.0
	average	1925.5	1925.4	204.9	78.9	2060.1	2057.0	8251.9
	minimum	1711.1	1671.5	184.3	72.0	1820.1	1801.8	7266.0
November	Maximum	2199.4	2154.9	282.1	84.1	2333.2	2305.2	9301.1
	average	1953.7	1912.7	251.7	74.2	2079.5	2059.6	8331.4
	minimum	1710.7	1730.2	223.0	65.6	1837.3	1844.2	7424.0
December	Maximum	2139.3	2021.8	281.5	86.0	2257.9	2207.2	8983.9
	average	1921.6	1866.2	256.1	77.7	2040.4	2015.7	8177.7
	minimum	1652.7	1631.2	222.4	70.5	1763.6	1753.4	7102.8
All years	Maximum	21329	21027	1806	1533	22687	22551	90931
	average	19812	19628	1729	1440	21125	21037	84771
	minimum	18248	18197	1639	1351	19492	19460	78418

Highest combined yield hour: 2019-03-21 03:30 UTC 59480.7 W (0.663 W/Wp) of 89760 Wp installed. Use this hour to size battery charge power.


Export energy as equivalent hours (kWh / grid kW)
Indonesia - Timika -4.534, 136.867
Equivalent hours
13.0
12.5
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year


Import energy as equivalent hours (kWh / grid kW)
Indonesia - Timika -4.534, 136.867
0.5
0.0
Equivalent hours
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year

Emergency import hours: 0 days with an emergency: 0
Indonesia - Timika -4.534, 136.867



Emergency = this hour’s grid import is above the month’s max import kW. 2 kW means up to 48 kWh in 24 hours. More than 2 kW in an hour is the higher grid fee.
Import inside that cap is not an emergency. Preferred cheap hours are 00:00–06:00 and 09:00–15:00 winter time.

Energy in kWh
Indonesia - Timika -4.534, 136.867

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	All
Export to grid													
month Maximum	8380	7758	8265	6796	6606	5961	4615	6228	6762	8024	8044	7785	77552
month average	7224	6650	7200	6103	5597	4101	3893	4735	5440	7049	7130	7017	72140
month minimum	6255	5678	6296	4923	4645	3171	2940	3860	4037	6212	6411	6094	66604
day Maximum	334.7	339.7	337.0	336.2	300.6	300.0	281.0	318.3	330.8	332.4	332.5	333.7	339.7
day average	233.0	235.7	232.2	203.4	180.5	136.7	125.6	152.8	181.3	227.4	237.7	226.4	197.5
day minimum	52.8	28.9	65.2	0.0	9.1	0.0	0.0	0.0	13.7	45.1	38.0	44.5	0.0
Import from grid													
month Maximum	0	0	0	0	0	0	0	0	0	0	0	0	0
month average	0	0	0	0	0	0	0	0	0	0	0	0	0
month minimum	0	0	0	0	0	0	0	0	0	0	0	0	0
day Maximum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
day average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
day minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total energy used for house													
month Maximum	463	434	461	441	457	441	455	455	440	459	448	464	5386
month average	457	416	456	439	454	439	455	455	440	454	440	455	5359
month minimum	453	409	453	438	453	438	455	455	440	453	438	453	5342
day Maximum	15.5	15.7	15.4	15.3	15.1	15.1	14.7	14.7	14.7	15.3	15.3	15.4	15.7
day average	14.7	14.7	14.7	14.6	14.6	14.6	14.7	14.7	14.7	14.6	14.7	14.7	14.7
day minimum	14.6	14.6	14.6	14.6	14.6	14.6	14.7	14.7	14.7	14.6	14.6	14.6	14.6

Month rows: kWh in that month. Day rows: best / average / worst day.
Total energy used for house = household + car + heating + cooling + DHW + direct electric.
PV not exported and not marked wasted is still in the battery, or could not leave because the grid was already full. It is not house use.

Energy by price
Indonesia - Timika -4.534, 136.867

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	All
Export													
month Maximum	1070	952	1023	868	879	840	784	851	860	989	994	1002	10470
month average	968	892	968	808	807	676	665	756	771	925	916	942	10094
month minimum	895	812	875	715	696	571	519	671	672	843	860	888	9694
day Maximum	43.9	44.1	45.5	39.6	39.6	39.4	37.4	39.8	40.4	44.9	44.4	43.3	45.5
day average	31.2	31.6	31.2	26.9	26.0	22.5	21.4	24.4	25.7	29.8	30.5	30.4	27.6
day minimum	8.3	6.4	9.0	0.0	2.0	0.0	0.0	0.0	3.0	6.4	5.7	6.5	0.0
Import													
month Maximum	0	0	0	0	0	0	0	0	0	0	0	0	0
month average	0	0	0	0	0	0	0	0	0	0	0	0	0
month minimum	0	0	0	0	0	0	0	0	0	0	0	0	0
day Maximum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
day average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
day minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Peak grid fee													
month Maximum	0	0	0	0	0	0	0	0	0	0	0	0	0
month average	0	0	0	0	0	0	0	0	0	0	0	0	0
month minimum	0	0	0	0	0	0	0	0	0	0	0	0	0
day Maximum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
day average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
day minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Import incl. peak fee													
month Maximum	0	0	0	0	0	0	0	0	0	0	0	0	0
month average	0	0	0	0	0	0	0	0	0	0	0	0	0
month minimum	0	0	0	0	0	0	0	0	0	0	0	0	0
day Maximum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
day average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
day minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Balance													
month Maximum	1070	952	1023	868	879	840	784	851	860	989	994	1002	10470
month average	968	892	968	808	807	676	665	756	771	925	916	942	10094
month minimum	895	812	875	715	696	571	519	671	672	843	860	888	9694
day Maximum	43.9	44.1	45.5	39.6	39.6	39.4	37.4	39.8	40.4	44.9	44.4	43.3	45.5
day average	31.2	31.6	31.2	26.9	26.0	22.5	21.4	24.4	25.7	29.8	30.5	30.4	27.6
day minimum	8.3	6.4	9.0	0.0	2.0	0.0	0.0	0.0	3.0	6.4	5.7	6.5	0.0

Currency in Your units. Import and export use the cent/kWh of that hour. Peak fee 6.33 / kW / month is the highest import hour of the month (hourly stand-in for the 15-minute peak) and is added to that month's
Sell only when export is above 0. At 0 cent, export PV yield only, not the battery. Do not sell when the earning is negative.

Export in kWh during price hours
Indonesia - Timika -4.534, 136.867

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	All
Export total													
month Maximum	8380	7758	8265	6796	6606	5961	4615	6228	6762	8024	8044	7785	77552
month average	7224	6650	7200	6103	5597	4101	3893	4735	5440	7049	7130	7017	72140
month minimum	6255	5678	6296	4923	4645	3171	2940	3860	4037	6212	6411	6094	66604
day Maximum	334.7	339.7	337.0	336.2	300.6	300.0	281.0	318.3	330.8	332.4	332.5	333.7	339.7
day average	233.0	235.7	232.2	203.4	180.5	136.7	125.6	152.8	181.3	227.4	237.7	226.4	197.5
day minimum	52.8	28.9	65.2	0.0	9.1	0.0	0.0	0.0	13.7	45.1	38.0	44.5	0.0
Export during high price hours													
month Maximum	3763	3543	3867	3651	3777	3588	3699	3868	3664	3584	3506	3724	42182
month average	3644	3353	3653	3486	3617	3233	3242	3558	3422	3453	3310	3559	41530
month minimum	3546	3222	3464	3310	3271	2789	2682	3206	3137	3268	3215	3465	40652
day Maximum	153.9	154.4	155.3	158.0	159.3	157.0	152.8	157.9	159.5	158.9	158.0	159.5	159.5
day average	117.6	118.8	117.8	116.2	116.7	107.8	104.6	114.8	114.1	111.4	110.3	114.8	113.7
day minimum	52.8	28.9	65.2	0.0	9.1	0.0	0.0	0.0	13.7	45.1	38.0	44.5	0.0
Export during medium price hours													
month Maximum	3593	3347	3568	2703	2299	1989	1103	2059	2500	3398	3522	3248	28443
month average	2872	2624	2811	2165	1705	796	627	1064	1671	2746	2890	2729	24700
month minimum	2350	2007	2141	1387	1215	288	201	319	812	2087	2394	2057	20672
day Maximum	153.0	158.1	152.7	154.4	134.1	124.4	123.6	144.6	147.4	158.0	154.0	152.0	158.1
day average	92.6	93.0	90.7	72.2	55.0	26.5	20.2	34.3	55.7	88.6	96.3	88.0	67.6
day minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Export during low price hours													
month Maximum	1112	1190	1100	727	590	383	66	418	724	1258	1225	1053	7634
month average	707	674	736	451	275	72	24	114	347	850	930	728	5910
month minimum	346	413	359	177	122	0	0	2	88	570	506	381	4592
day Maximum	81.4	81.0	81.0	81.0	58.6	60.4	32.4	70.0	81.0	81.0	81.0	81.0	81.4
day average	22.8	23.9	23.8	15.0	8.9	2.4	0.8	3.7	11.6	27.4	31.0	23.5	16.2
day minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

kWh exported while that price band was active. Not the money. Winter time. High 06:00–09:00 and 17:00–20:00, sold first. Low 09:00–15:00, sold last. Medium is the rest.

Heat pump
Indonesia - Timika -4.534, 136.867

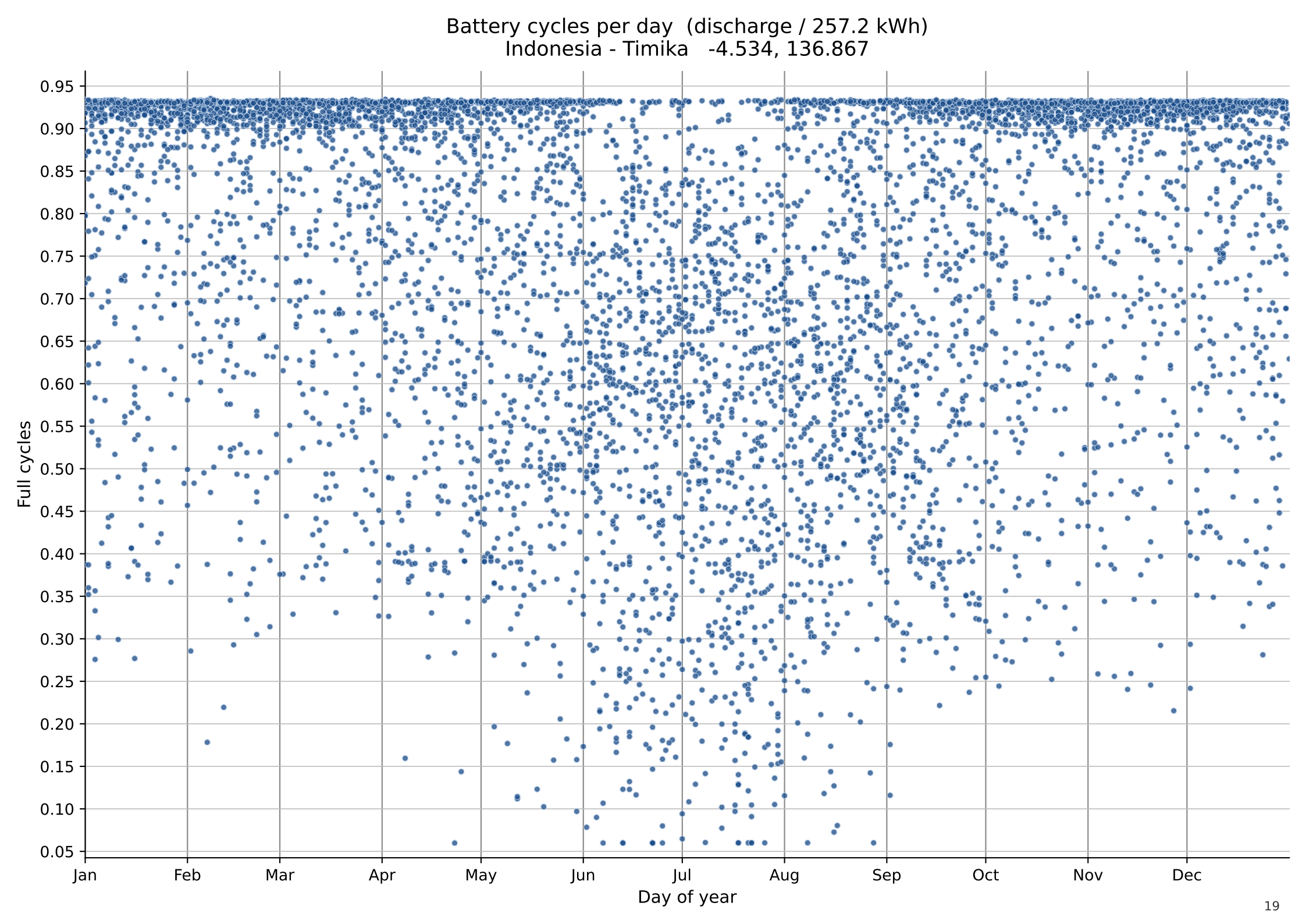
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	All
Heating													
month Maximum	0	0	0	0	0	0	0	0	0	0	0	0	0
month average	0	0	0	0	0	0	0	0	0	0	0	0	0
month minimum	0	0	0	0	0	0	0	0	0	0	0	0	0
day Maximum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
day average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
day minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cooling													
month Maximum	10.34	9.96	7.68	2.28	3.93	2.11	0.00	0.00	0.00	5.56	9.23	10.79	43.12
month average	4.03	3.78	2.94	0.62	0.47	0.11	0.00	0.00	0.00	0.64	1.84	2.44	16.86
month minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30
day Maximum	0.87	1.06	0.83	0.72	0.46	0.49	0.00	0.00	0.00	0.66	0.72	0.83	1.06
day average	0.13	0.13	0.09	0.02	0.02	0.00	0.00	0.00	0.00	0.02	0.06	0.08	0.05
day minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DHW													
month Maximum	19	18	19	18	19	19	21	21	20	19	18	19	230
month average	19	17	19	18	19	19	21	21	20	19	18	19	229
month minimum	19	17	19	18	19	18	21	21	20	19	18	19	229
day Maximum	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.7
day average	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6
day minimum	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6
Direct electric													
month Maximum	0	0	0	0	0	0	0	0	0	0	0	0	0
month average	0	0	0	0	0	0	0	0	0	0	0	0	0
month minimum	0	0	0	0	0	0	0	0	0	0	0	0	0
day Maximum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
day average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
day minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

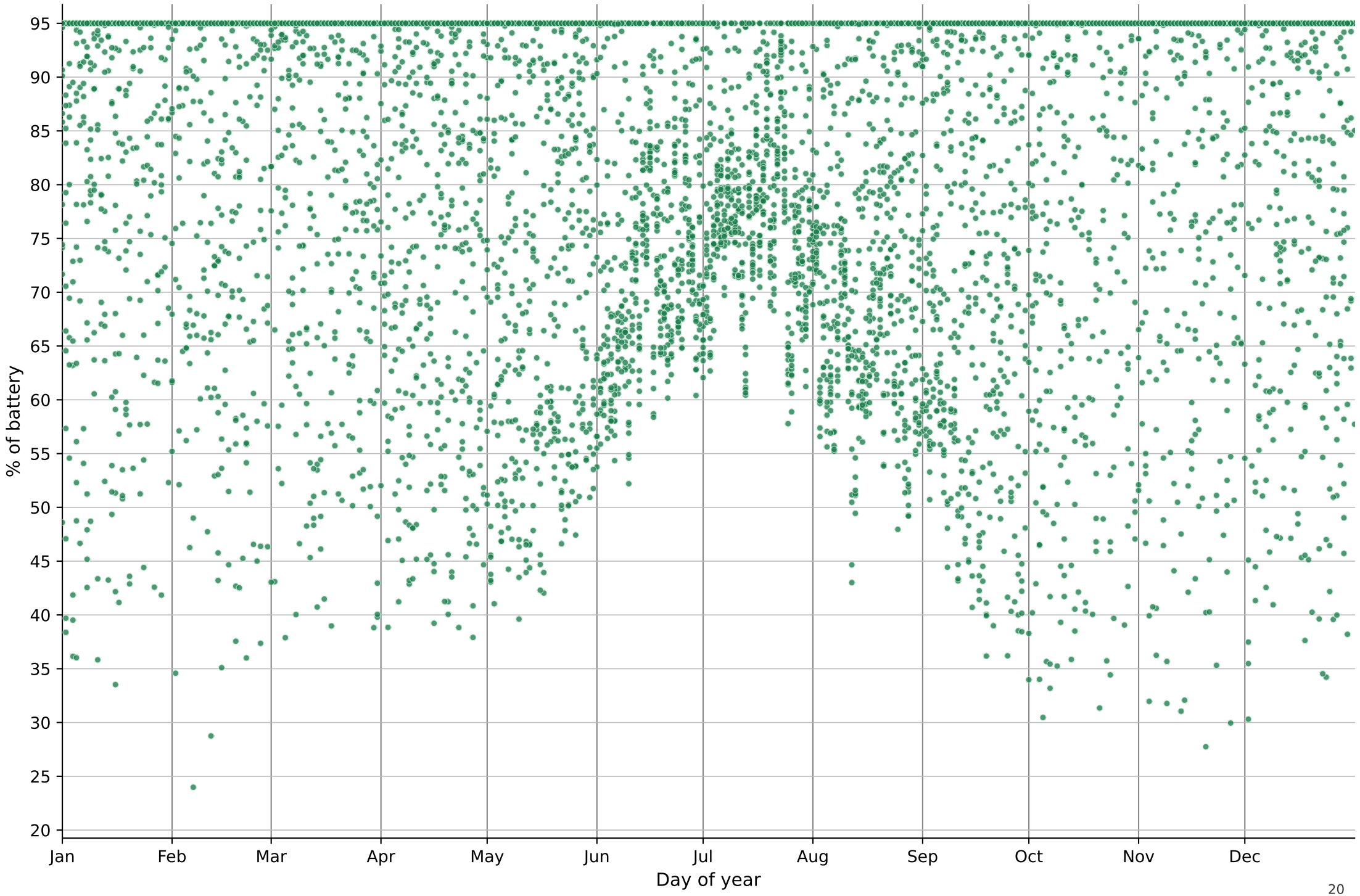
Heating, cooling and DHW are electricity. Direct electric is the part the heat pump could not cover.

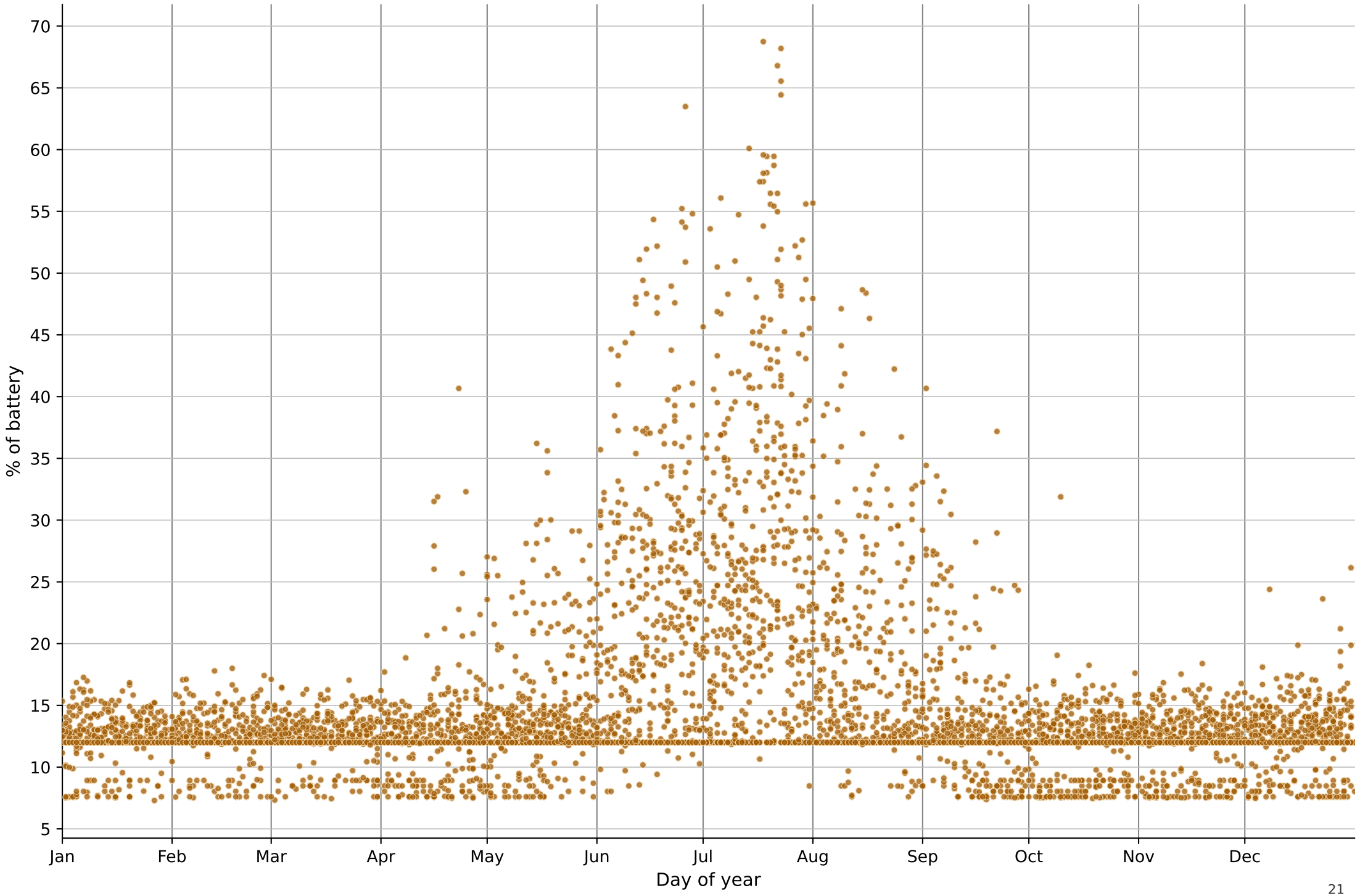
Battery
Indonesia - Timika -4.534, 136.867

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	All
Wasted													
month Maximum	401	558	343	172	79	37	18	134	178	395	345	281	1984
month average	214	231	232	98	31	6	2	18	61	207	233	172	1505
month minimum	70	94	89	37	2	0	0	0	2	114	109	70	1011
day Maximum	52.4	55.6	60.4	51.3	25.3	25.7	11.7	40.9	44.4	64.5	52.2	47.3	64.5
day average	6.9	8.2	7.5	3.3	1.0	0.2	0.1	0.6	2.0	6.7	7.8	5.5	4.1
day minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Full cycles													
month Maximum	28.64	25.32	28.38	25.88	25.07	23.43	20.23	24.34	24.78	27.90	27.46	27.47	290.14
month average	26.35	23.91	26.13	23.65	22.75	17.88	17.45	20.26	21.69	25.57	25.47	25.90	277.00
month minimum	24.64	21.72	23.84	20.55	19.73	14.77	13.84	17.56	17.52	23.22	23.85	24.18	263.01
day Maximum	0.93	0.94	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.94
day average	0.85	0.85	0.84	0.79	0.73	0.60	0.56	0.65	0.72	0.82	0.85	0.84	0.76
day minimum	0.28	0.18	0.33	0.06	0.10	0.06	0.06	0.06	0.12	0.24	0.22	0.24	0.06
Charge C													
month Maximum	0.22	0.22	0.22	0.21	0.20	0.19	0.19	0.21	0.22	0.22	0.22	0.22	2.46
month average	0.21	0.21	0.21	0.20	0.19	0.17	0.17	0.18	0.20	0.21	0.21	0.21	2.39
month minimum	0.20	0.20	0.20	0.19	0.18	0.15	0.14	0.17	0.19	0.20	0.20	0.20	2.34
day Maximum	0.22	0.22	0.22	0.21	0.20	0.19	0.19	0.21	0.22	0.22	0.22	0.22	0.22
day average	0.16	0.16	0.16	0.14	0.13	0.11	0.10	0.12	0.13	0.16	0.16	0.16	0.14
day minimum	0.04	0.04	0.05	0.04	0.02	0.01	0.02	0.02	0.03	0.04	0.05	0.04	0.01
Discharge C													
month Maximum	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.12	0.12	0.12	1.38
month average	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	1.38
month minimum	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	1.38
day Maximum	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.12	0.12	0.12	0.12
day average	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
day minimum	0.11	0.09	0.11	0.00	0.04	0.00	0.00	0.00	0.06	0.11	0.11	0.11	0.00

Wasted = PV left when the export price is negative and the battery is full. Full cycles = discharge kWh / 257.2 kWh. Battery export only into hours whose export price is above 0, highest price first. At 0 cent on


Battery cycles per day (discharge / 257.2 kWh)
Indonesia - Timika -4.534, 136.867
Full cycles
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year


Battery max charge state per day (257.2 kWh = 100 %)
Indonesia - Timika -4.534, 136.867
% of battery
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year


Battery min charge state per day (257.2 kWh = 100 %)
Indonesia - Timika -4.534, 136.867
% of battery
70
65
60
55
50
45
40
35
30
25
20
15
10
5
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year