Scenario — PV
GEMINI-60-house-with-garage Austria - Fürstenbrunn 47.744, 12.993

Name	Slope °	Azimuth °	Wp	Wall d/h m	Face	Bifacial	Wp counted
Roof East	22	-90	19,800	—	front	—	yes
Roof West	22	90	19,800	—	front	—	yes
Terrace railing south	90	0	4,620	5 / 4	front	—	yes
Terrace railing north	90	180	4,620	5 / 4	front	—	yes
Garage roof	1	0	10,740	—	front	—	yes
Garage side wall south	90	0	3,475	5 / 4	front	—	yes
Garage side wall north	90	180	3,475	5 / 4	front	—	yes
Garage door side west	90	90	700	5 / 4	front	—	yes
Garage back side east	90	-90	2,540	5 / 4	front	—	yes
Garden fence east	90	-90	6,000	5 / 4	face 1	—	yes
Garden fence east face2	90	90	4,800	5 / 4	face 2	80 %	no
Total counted			75,770				

Location: Fürstenbrunn is just north of Mount Untersberg. Several months in the winter with no direct sunlight.
Database PVGIS-SARAH3 2005–2023 loss 14 % azimuth 0 = south, 90 = west, −90 = east.
Price bands and charts use UTC+1 from longitude (15° per hour), not the political time zone.
Peak hour 2021-06-01 11:10 local (10:10 UTC) 41,931 W 0.553 W/Wp of 75,770 Wp.
Database gaps: 10 days with 0 yield while the sun reached the horizon at noon. 2008-01-23, 2008-03-01, 2008-03-06, 2008-05-17, 2008-05-18, 2009-04-18, 2009-04-19, 2009-08-15, 2009-08-16, 2016-10-16. 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 import/export scheduling.

Scenario — house, heat pump, battery
GEMINI-60-house-with-garage Austria - Fürstenbrunn 47.744, 12.993

Chapter	Parameter	Value
Building	Design out / in / heat	-10.0 °C / 20.0 °C / 1,600 W
	Heat on / cool on / ground	22.0 °C / 25.0 °C / 10.0 °C
	Curve / flow min / max	0.3 / 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 L tank 42.0 °C 8–18 h
	Water out of the pipe Q1–Q4	8 °C 10 °C 12 °C 10 °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	4.0 5.0 6.0
	kW −10/0/10 @ 50 °C	3.5 4.5 5.0
Battery	kWh / C-rate / SOC min–max–start	176.8 kWh C 0.5 5 / 95 / 50 %
	Nameplate	—
	Charge / discharge η	95 % / 90 %
Grid	Inverter / grid connection	34.0 kW / 17.0 kW
	Max export	17.0 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 @ 40.0 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
Austria - Fürstenbrunn 47.744, 12.993

PV	2021-06-01 10:10	2023-06-13 10:10	2022-04-17 10:10	2022-04-17 11:10	2022-04-29 10:10	2023-06-13 11:10	2017-04-30 10:10	2021-04-26 11:10	2021-04-23 10:10	2022-04-18 10:10
Roof East	15,052	15,101	14,618	13,719	14,702	14,277	14,480	13,682	14,454	14,455
Roof West	12,690	12,668	11,678	13,872	12,063	14,400	11,975	13,920	11,743	11,586
Terrace railing south	2,019	1,920	2,812	2,972	2,531	2,030	2,489	2,717	2,634	2,757
Terrace railing north	159	157	173	130	125	131	227	130	182	156
Garage roof	8,034	8,043	7,675	8,038	7,793	8,292	7,676	8,021	7,627	7,598
Garage side wall south	1,519	1,444	2,115	2,236	1,904	1,527	1,873	2,044	1,981	2,074
Garage side wall north	119	118	130	97	94	98	170	98	137	117
Garage door side west	24	24	26	63	19	65	34	65	28	24
Garage back side east	639	650	715	71	655	72	684	71	688	700
Garden fence east	1,511	1,535	1,689	168	1,548	170	1,617	169	1,624	1,653
Garden fence east face2	165	163	180	429	129	449	235	443	189	162
Watt at record	41,931	41,824	41,811	41,796	41,562	41,511	41,460	41,360	41,287	41,281
Percent of installed peak	55.3	55.2	55.2	55.2	54.9	54.8	54.7	54.6	54.5	54.5

Values are watts at that hour. Date and time are UTC. Record 41,931 W (55.3 % of 75,770 Wp).

Hours at or above a share of the record
Austria - Fürstenbrunn 47.744, 12.993

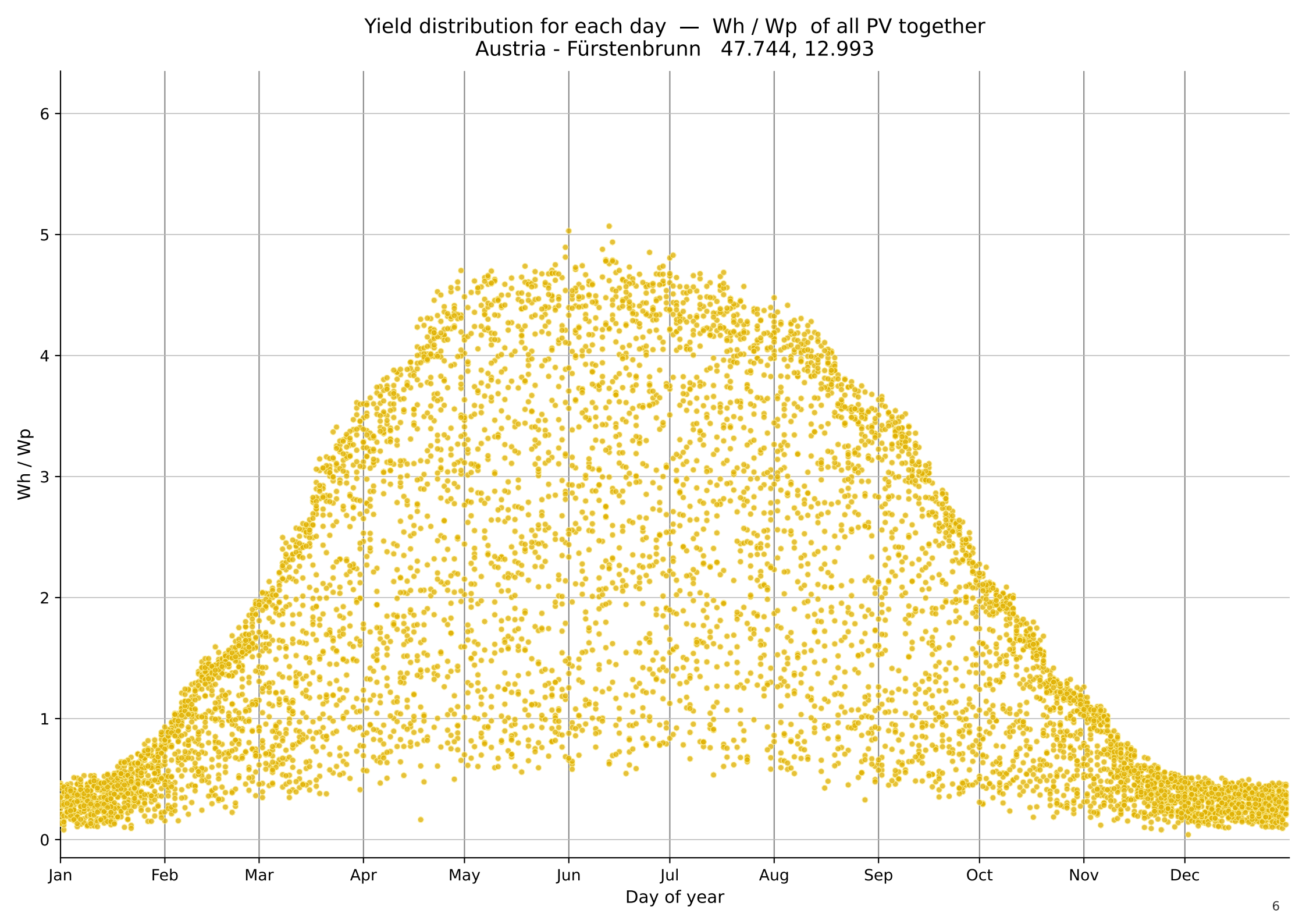
Of the record	Hours	Watts
98 %	15	41,092 W
96 %	70	40,254 W
94 %	190	39,415 W
92 %	452	38,577 W
90 %	951	37,738 W

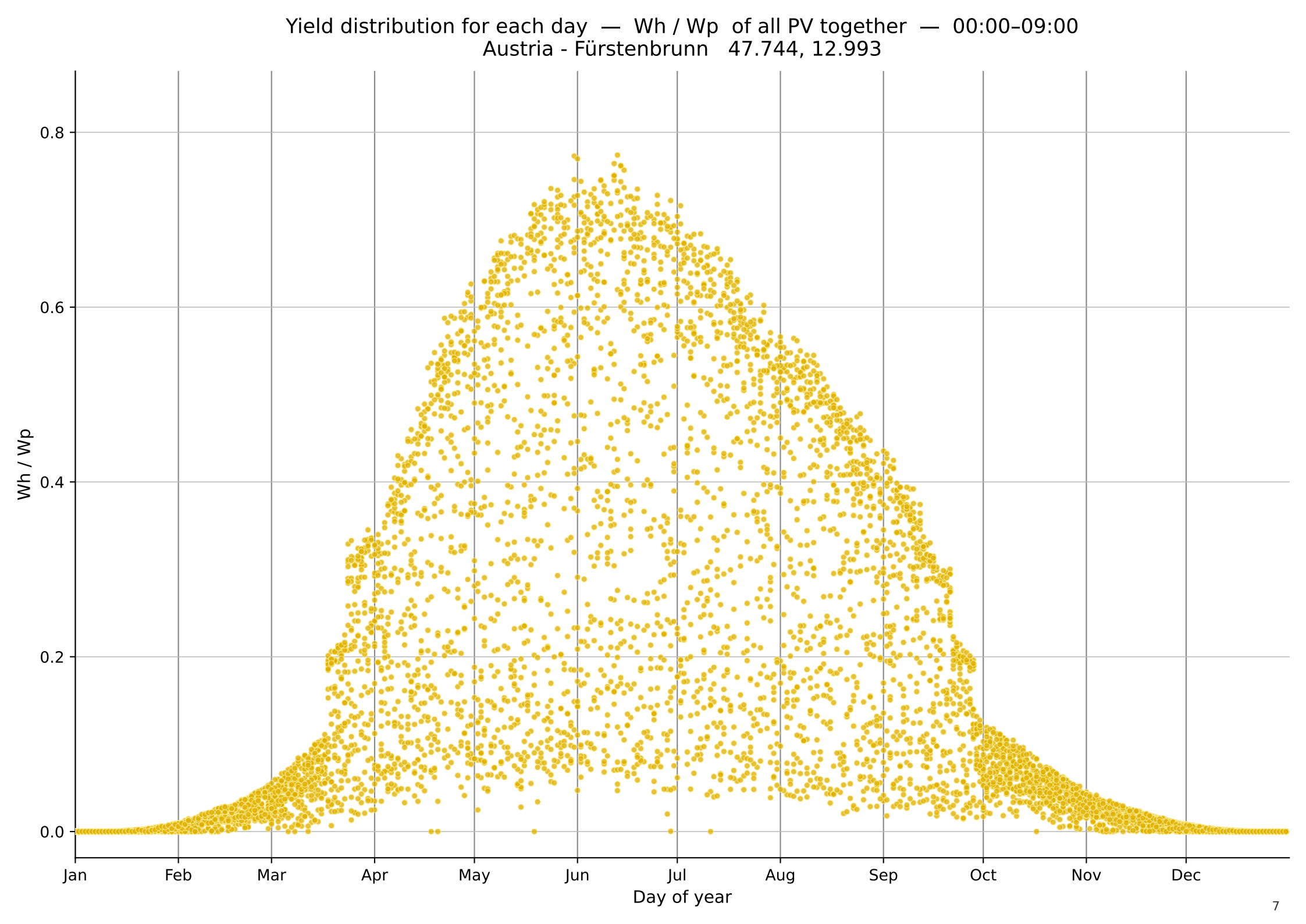
Record hour = 41,931 W combined.

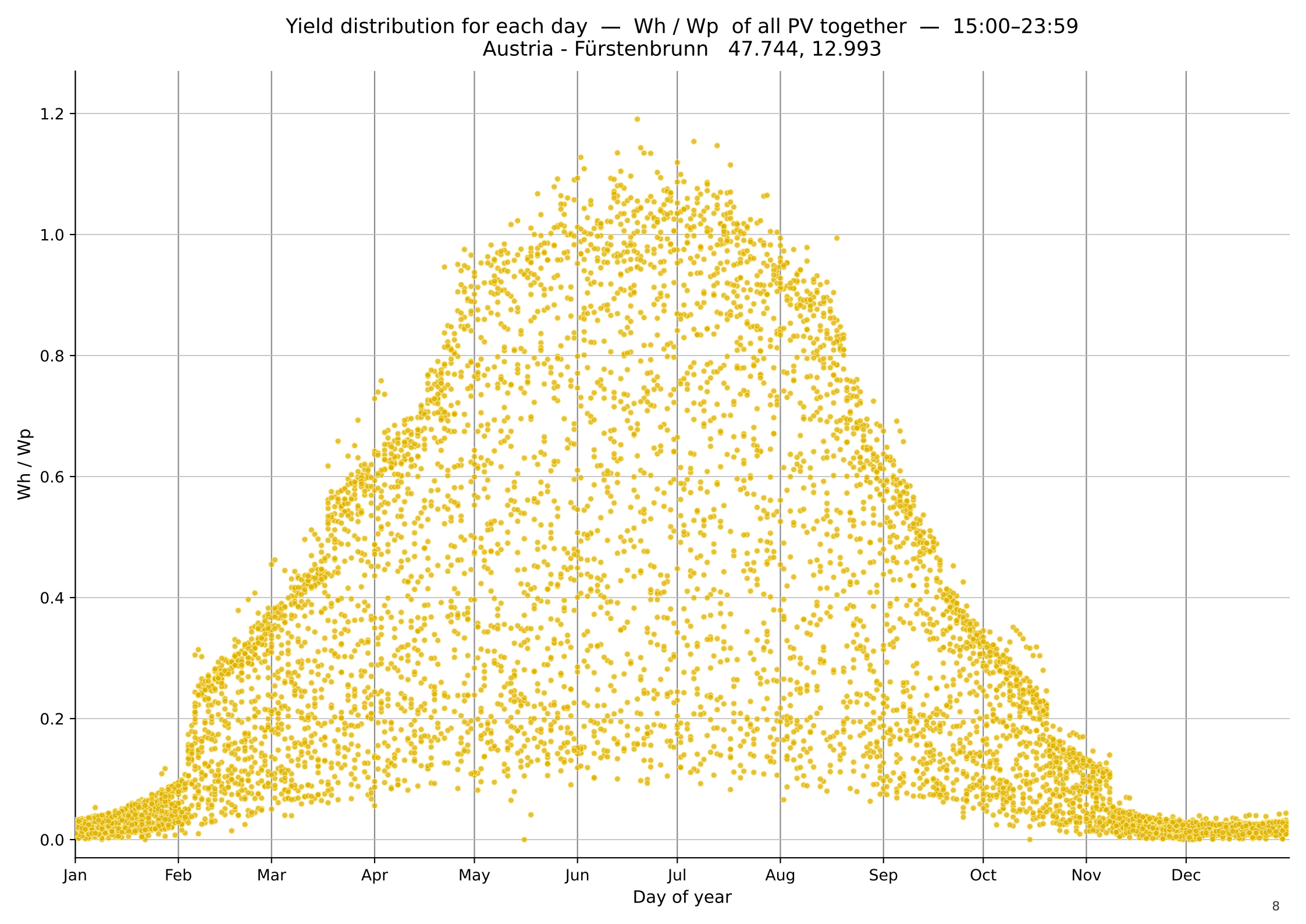
Records of each photovoltaic field
Austria - Fürstenbrunn 47.744, 12.993

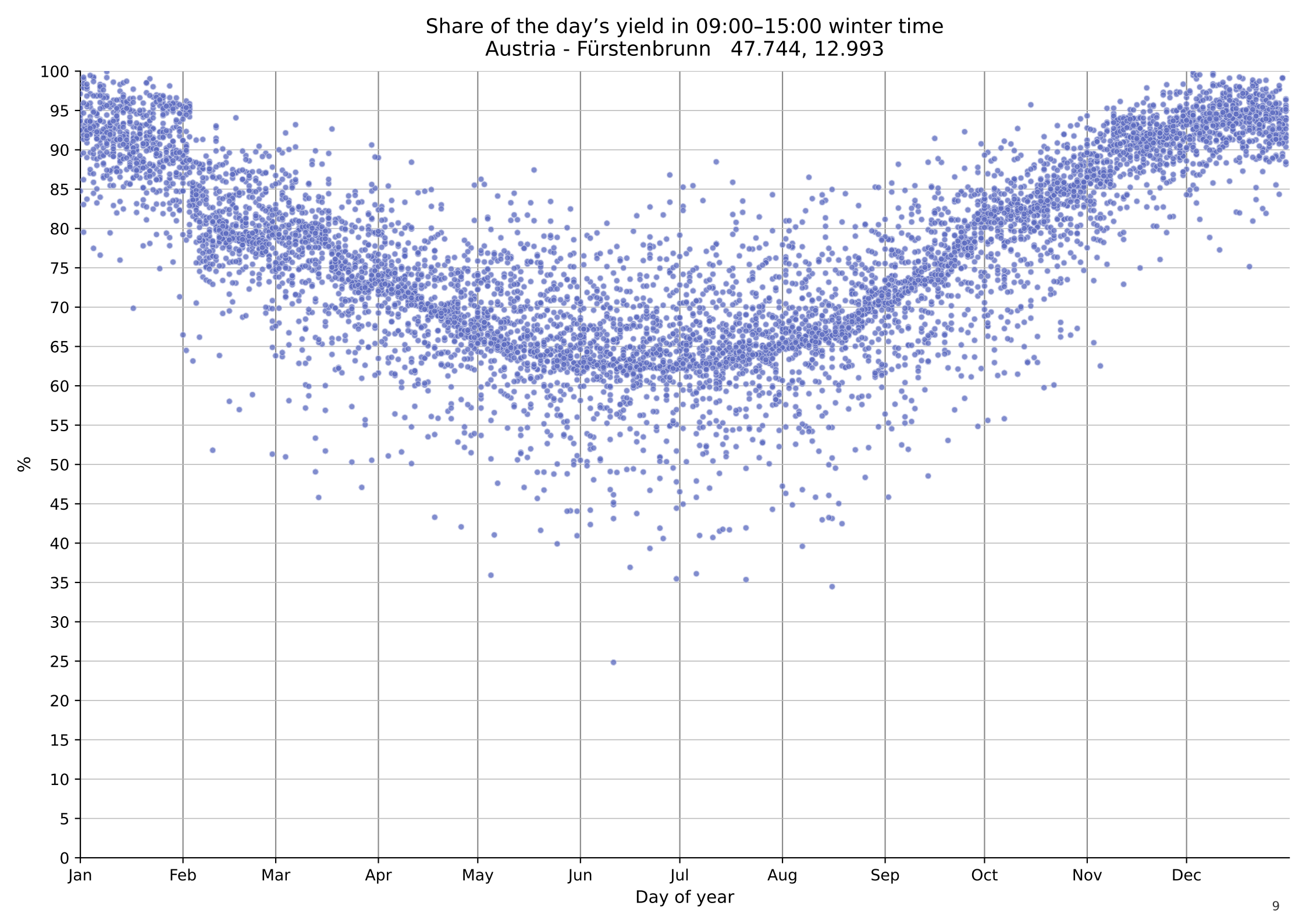
PV	Date	Watts	%	h ≥98%	h ≥96%	h ≥94%	h ≥92%	h ≥90%
Roof East	2021-06-01 09:10	15,470	78.1	2	14	40	125	284
Roof West	2021-06-01 13:10	15,331	77.4	5	20	80	171	373
Terrace railing south	2020-03-23 11:10	3,601	77.9	2	5	11	17	38
Terrace railing north	2015-06-20 11:10	759	16.4	4	16	59	167	324
Garage roof	2023-06-13 11:10	8,292	77.2	1	12	35	97	266
Garage side wall south	2020-03-23 11:10	2,709	77.9	2	5	11	17	38
Garage side wall north	2015-06-20 11:10	571	16.4	4	16	59	167	324
Garage door side west	2021-04-26 14:10	449	64.2	2	8	23	44	75
Garage back side east	2021-04-23 08:10	1,610	63.4	6	10	23	49	99
Garden fence east	2021-04-23 08:10	3,944	65.7	6	16	41	77	178

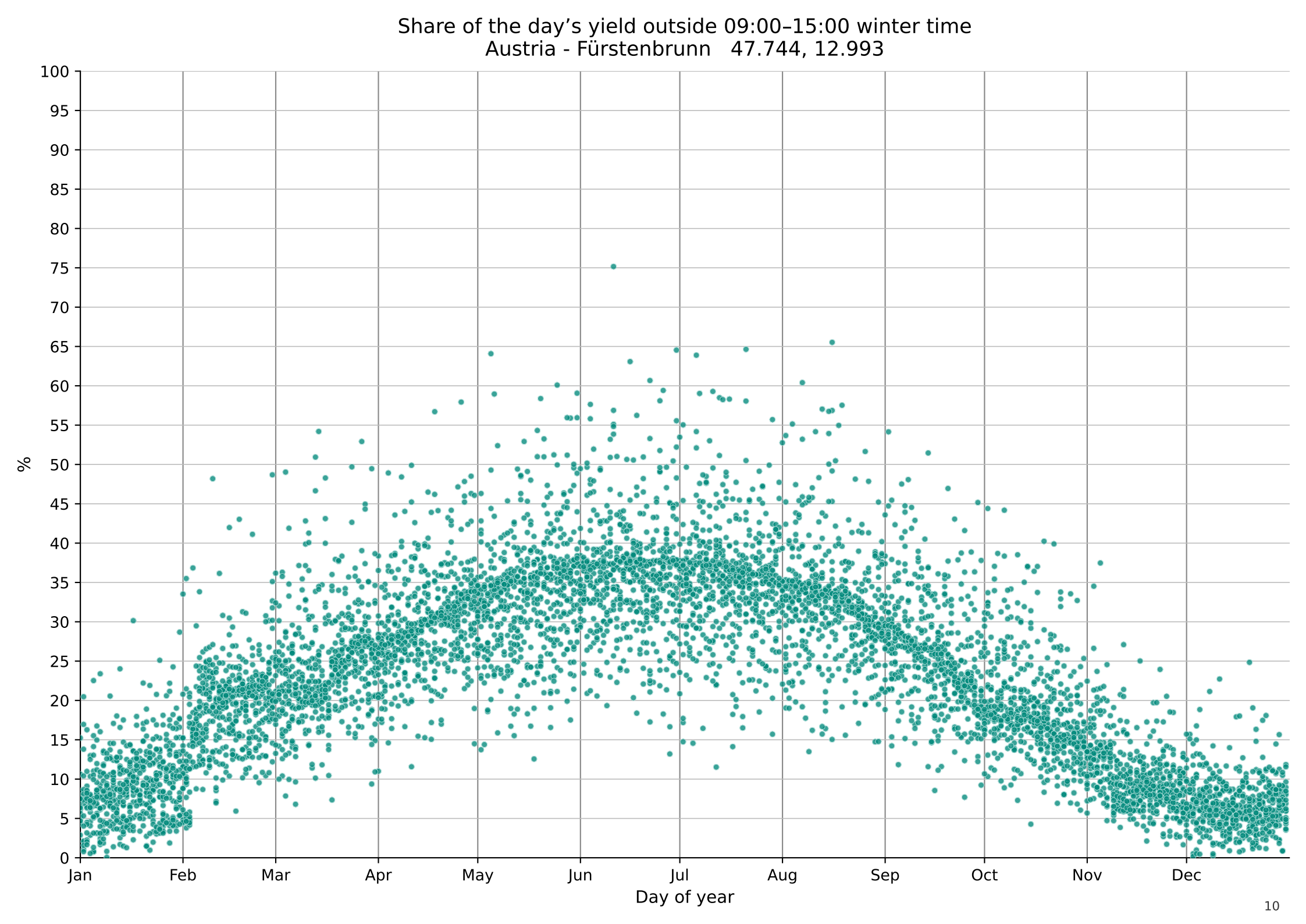
Watts is the highest hour of that field. % is of its own Wp. Hours are the count of hours at or above that share of its own record. Use this to size the MPPT or the inverter for that field.

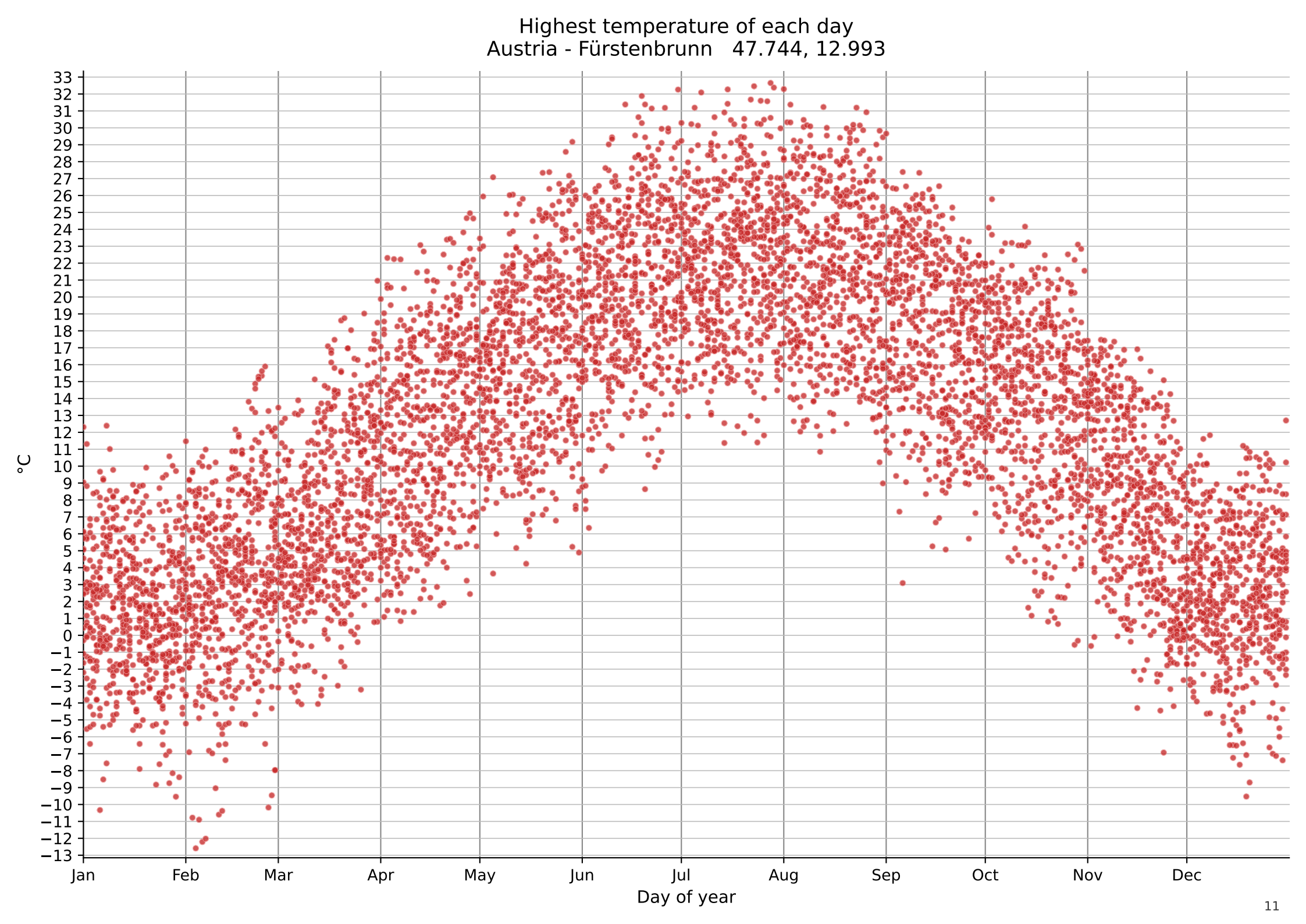

Yield distribution for each day — Wh / Wp of all PV together
Austria - Fürstenbrunn 47.744, 12.993
Wh / Wp
0
1
2
3
4
5
6
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year

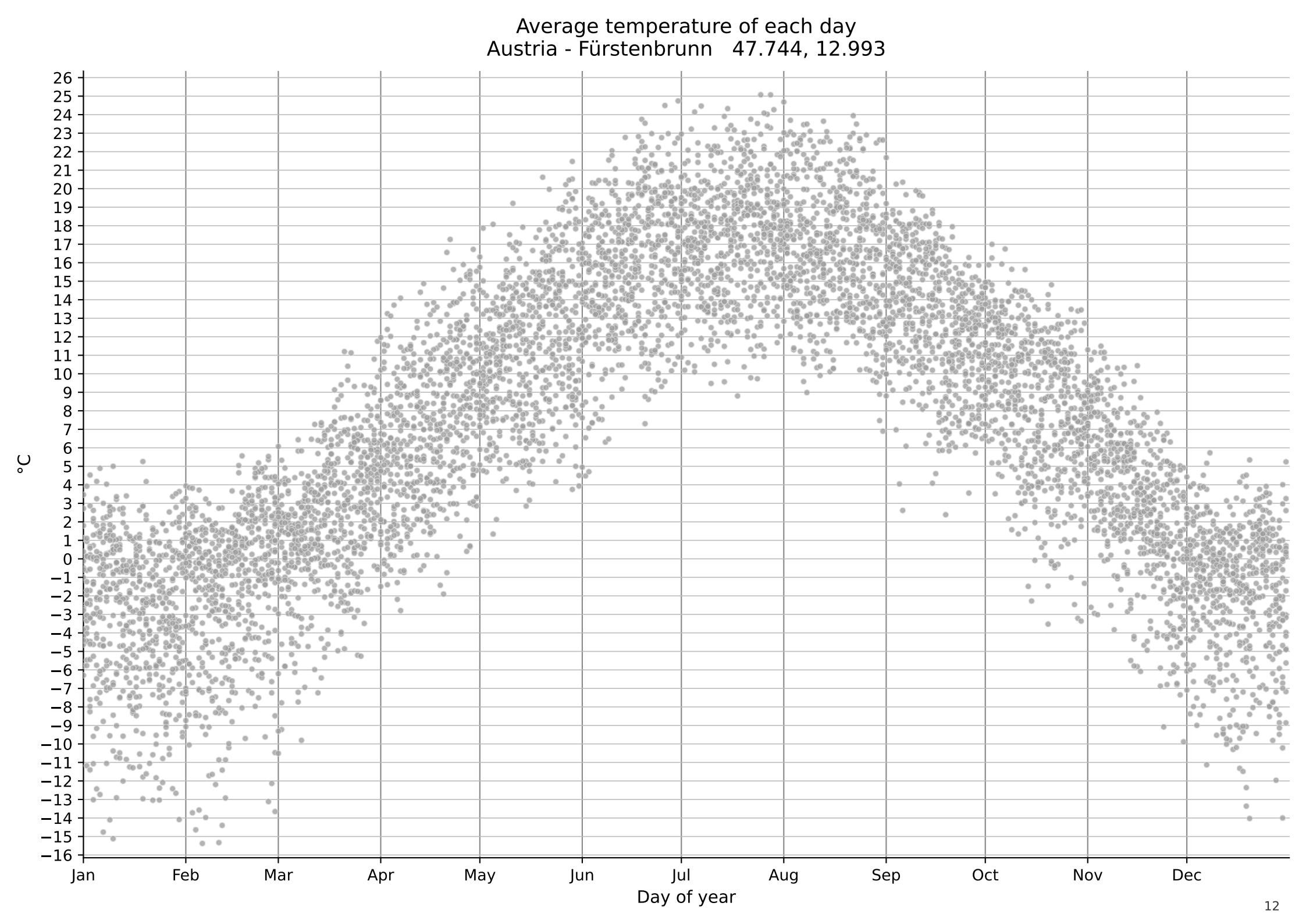

Yield distribution for each day — Wh / Wp of all PV together — 00:00–09:00
Austria - Fürstenbrunn 47.744, 12.993
Wh / Wp
0.0
0.2
0.4
0.6
0.8
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year

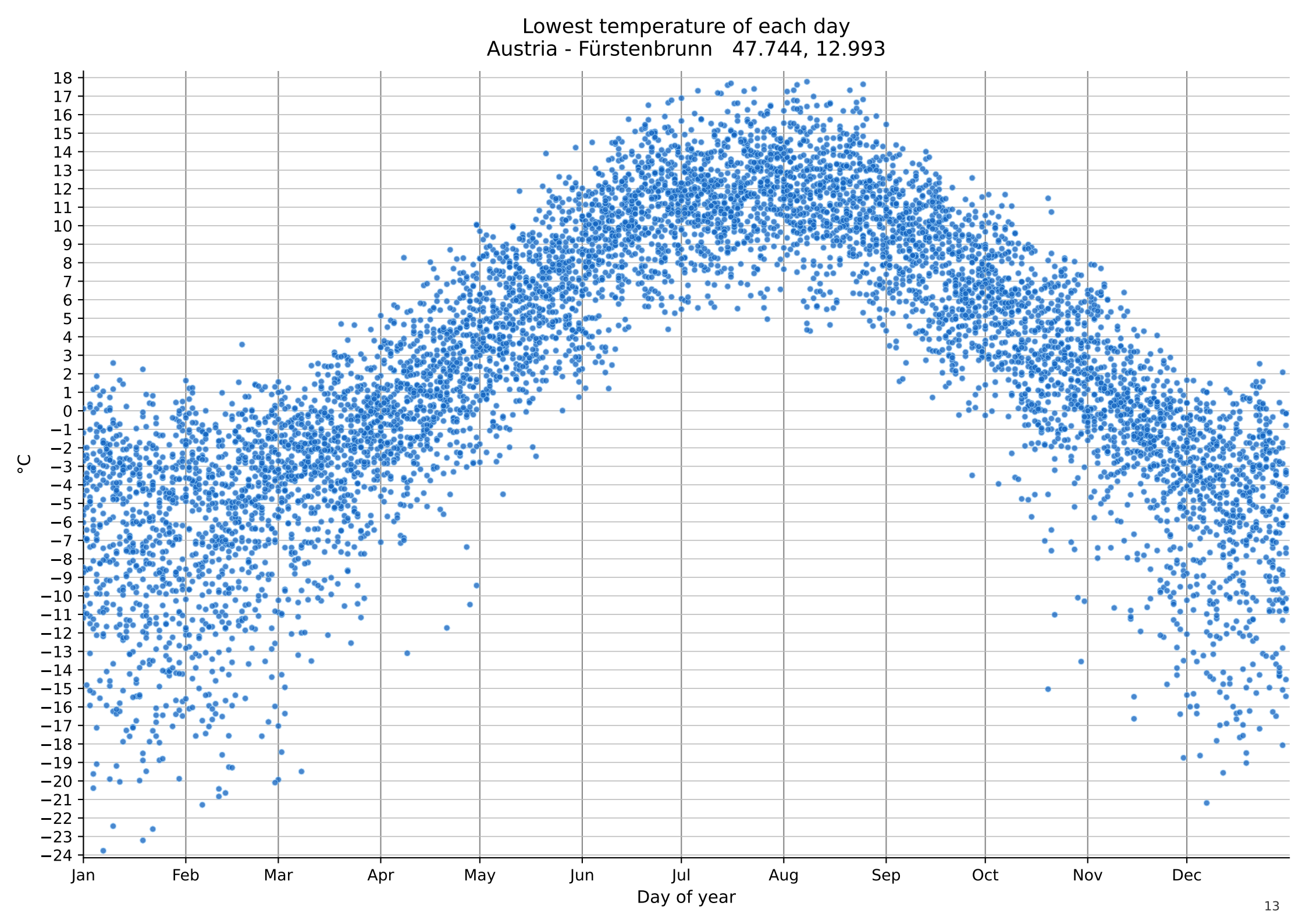

Yield distribution for each day — Wh / Wp of all PV together — 15:00–23:59
Austria - Fürstenbrunn 47.744, 12.993
Wh / Wp
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year

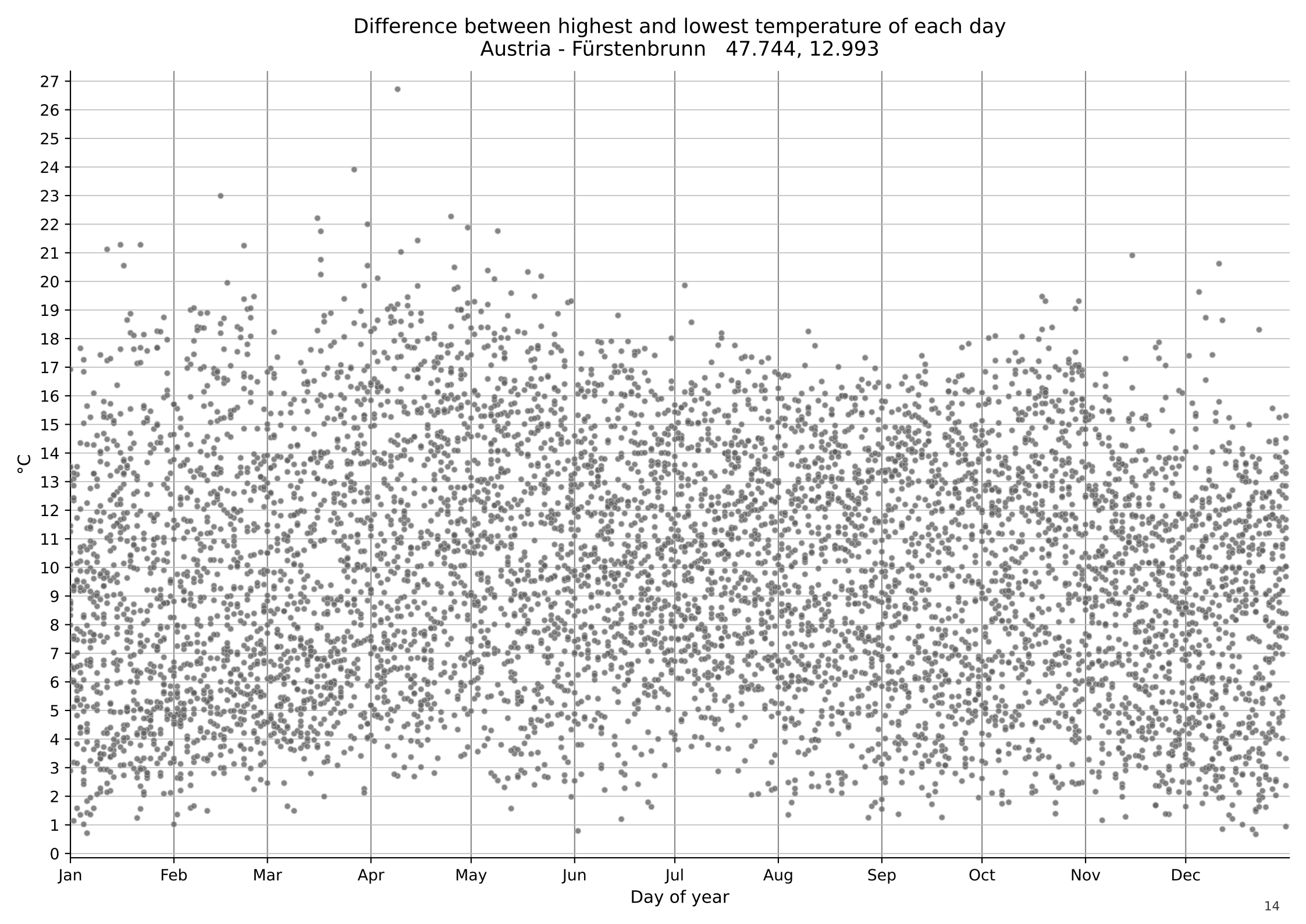

Share of the day’s yield in 09:00–15:00 winter time
Austria - Fürstenbrunn 47.744, 12.993
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
%
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year


Share of the day’s yield outside 09:00–15:00 winter time
Austria - Fürstenbrunn 47.744, 12.993
%
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year


Highest temperature of each day
Austria - Fürstenbrunn 47.744, 12.993
°C
33
32
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
−1
−2
−3
−4
−5
−6
−7
−8
−9
−10
−11
−12
−13
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year


Average temperature of each day
Austria - Fürstenbrunn 47.744, 12.993
°C
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
−1
−2
−3
−4
−5
−6
−7
−8
−9
−10
−11
−12
−13
−14
−15
−16
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year


Lowest temperature of each day
Austria - Fürstenbrunn 47.744, 12.993
°C
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
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
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year


Difference between highest and lowest temperature of each day
Austria - Fürstenbrunn 47.744, 12.993
°C
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
26
27
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year

Monthly and yearly specific yield (kWh/kWp = Wh/Wp)
Austria - Fürstenbrunn 47.744, 12.993

Month / year		Roof East 22°/-90° 19,800 Wp	Roof West 22°/90° 19,800 Wp	Terrace railing south 90°/0° 4,620 Wp	Terrace railing north 90°/180° 4,620 Wp	Garage roof 1°/0° 10,740 Wp	Garage side wall south 90°/0° 3,475 Wp	All together
January	Maximum	18.03	19.49	6.89	6.89	20.06	6.89	15.40
	average	14.36	15.73	5.33	5.33	16.13	5.33	12.28
	minimum	10.57	10.81	3.97	3.97	11.41	3.97	8.79
February	Maximum	36.31	52.07	10.66	10.66	46.86	10.66	32.49
	average	32.21	43.41	8.08	8.08	40.05	8.08	28.89
	minimum	25.78	33.41	6.51	6.51	31.67	6.51	23.34
March	Maximum	95.77	100.98	37.61	16.24	105.21	37.61	74.67
	average	69.12	73.03	31.79	14.02	75.09	31.79	55.98
	minimum	53.89	57.55	25.70	11.57	58.41	25.70	45.12
April	Maximum	124.42	118.57	78.45	21.72	127.30	78.45	98.00
	average	96.88	95.27	61.13	19.28	100.34	61.13	78.91
	minimum	73.37	70.36	44.89	16.17	74.76	44.89	59.65
May	Maximum	128.48	122.50	68.89	27.16	131.31	68.89	101.87
	average	106.35	102.69	58.13	24.16	109.17	58.13	86.00
	minimum	68.79	66.94	37.37	20.29	70.65	37.37	56.66
June	Maximum	142.83	136.46	66.88	27.98	146.65	66.88	112.13
	average	112.78	109.75	54.50	24.64	116.58	54.50	90.44
	minimum	84.19	89.36	43.30	22.16	90.51	43.30	71.46
July	Maximum	142.35	136.38	71.10	26.14	146.41	71.10	112.70
	average	115.42	112.31	58.85	24.12	119.39	58.85	92.85
	minimum	99.54	97.33	50.65	20.00	103.21	50.65	80.55
August	Maximum	119.38	117.63	72.48	22.28	124.22	72.48	95.86
	average	101.50	99.45	61.73	19.57	104.98	61.73	82.39
	minimum	76.60	77.61	46.80	17.59	79.98	46.80	64.47
September	Maximum	94.36	92.79	56.44	15.36	98.60	56.44	74.40
	average	75.39	74.39	44.54	13.74	78.73	44.54	60.29
	minimum	63.75	58.53	34.81	12.09	65.14	34.81	49.89
October	Maximum	50.52	67.90	11.08	10.24	62.90	11.08	43.74
	average	43.80	53.61	9.82	9.27	51.82	9.82	36.94
	minimum	30.56	35.67	8.59	7.39	34.92	8.59	26.07
November	Maximum	20.77	28.65	6.56	6.56	26.75	6.56	18.87
	average	18.35	22.65	5.73	5.73	21.98	5.73	16.18
	minimum	15.73	18.34	4.80	4.80	18.15	4.80	13.63
December	Maximum	13.16	13.16	5.18	5.18	14.05	5.18	10.94
	average	11.26	11.26	4.36	4.36	12.03	4.36	9.33
	minimum	8.54	8.54	3.17	3.17	9.15	3.17	7.02
All years	Maximum	861.7	871.4	436.7	181.1	909.5	436.7	695.5
	average	797.4	813.5	404.0	172.3	846.3	404.0	650.5
	minimum	721.0	761.5	369.8	162.2	786.0	369.8	605.5

Highest combined yield hour: 2021-06-01 10:10 UTC 41,931.1 W (0.553 W/Wp) of 75,770 Wp installed. Use this hour to size battery charge power.

Monthly and yearly specific yield (kWh/kWp = Wh/Wp)
Austria - Fürstenbrunn 47.744, 12.993

Month / year		Garage side wall north 90°/180° 3,475 Wp	Garage door side west 90°/90° 700 Wp	Garage back side east 90°/-90° 2,540 Wp	Garden fence east 90°/-90° + 90°/90° 6000 Wp bifacial ×80%	All together
January	Maximum	6.89	6.89	6.92	12.43	15.40
	average	5.33	5.33	5.36	9.62	12.28
	minimum	3.97	3.97	3.98	7.16	8.79
February	Maximum	10.66	12.11	11.68	21.37	32.49
	average	8.08	9.63	9.12	16.82	28.89
	minimum	6.51	8.15	7.62	14.53	23.34
March	Maximum	16.24	19.08	19.26	34.52	74.67
	average	14.02	17.71	17.79	31.96	55.98
	minimum	11.57	15.90	16.16	28.88	45.12
April	Maximum	21.72	33.95	37.90	65.07	98.00
	average	19.28	30.78	32.39	57.02	78.91
	minimum	16.17	24.49	26.95	46.54	59.65
May	Maximum	27.16	43.79	46.27	79.18	101.87
	average	24.16	38.64	38.21	69.12	86.00
	minimum	20.29	27.09	27.09	48.77	56.66
June	Maximum	27.98	44.61	46.72	82.24	112.13
	average	24.64	39.21	39.58	70.95	90.44
	minimum	22.16	34.51	31.91	59.56	71.46
July	Maximum	26.14	44.47	49.85	85.43	112.70
	average	24.12	38.51	42.21	73.02	92.85
	minimum	20.00	32.03	37.42	63.05	80.55
August	Maximum	22.28	35.35	40.63	68.54	95.86
	average	19.57	32.88	34.81	61.12	82.39
	minimum	17.59	28.36	29.45	52.28	64.47
September	Maximum	15.36	23.35	23.13	41.81	74.40
	average	13.74	20.67	20.09	36.63	60.29
	minimum	12.09	16.48	16.92	30.25	49.89
October	Maximum	10.24	11.42	12.66	21.79	43.74
	average	9.27	10.59	11.79	20.26	36.94
	minimum	7.39	8.86	10.30	17.69	26.07
November	Maximum	6.56	7.19	6.69	12.45	18.87
	average	5.73	6.30	5.94	10.98	16.18
	minimum	4.80	5.43	4.94	9.28	13.63
December	Maximum	5.18	5.18	5.18	9.33	10.94
	average	4.36	4.36	4.36	7.84	9.33
	minimum	3.17	3.17	3.17	5.70	7.02
All years	Maximum	181.1	267.8	281.5	494.5	695.5
	average	172.3	254.6	261.7	465.3	650.5
	minimum	162.2	241.2	245.3	440.3	605.5

Highest combined yield hour: 2021-06-01 10:10 UTC 41,931.1 W (0.553 W/Wp) of 75,770 Wp installed. Use this hour to size battery charge power.

Monthly and yearly total yield (kWh)
Austria - Fürstenbrunn 47.744, 12.993

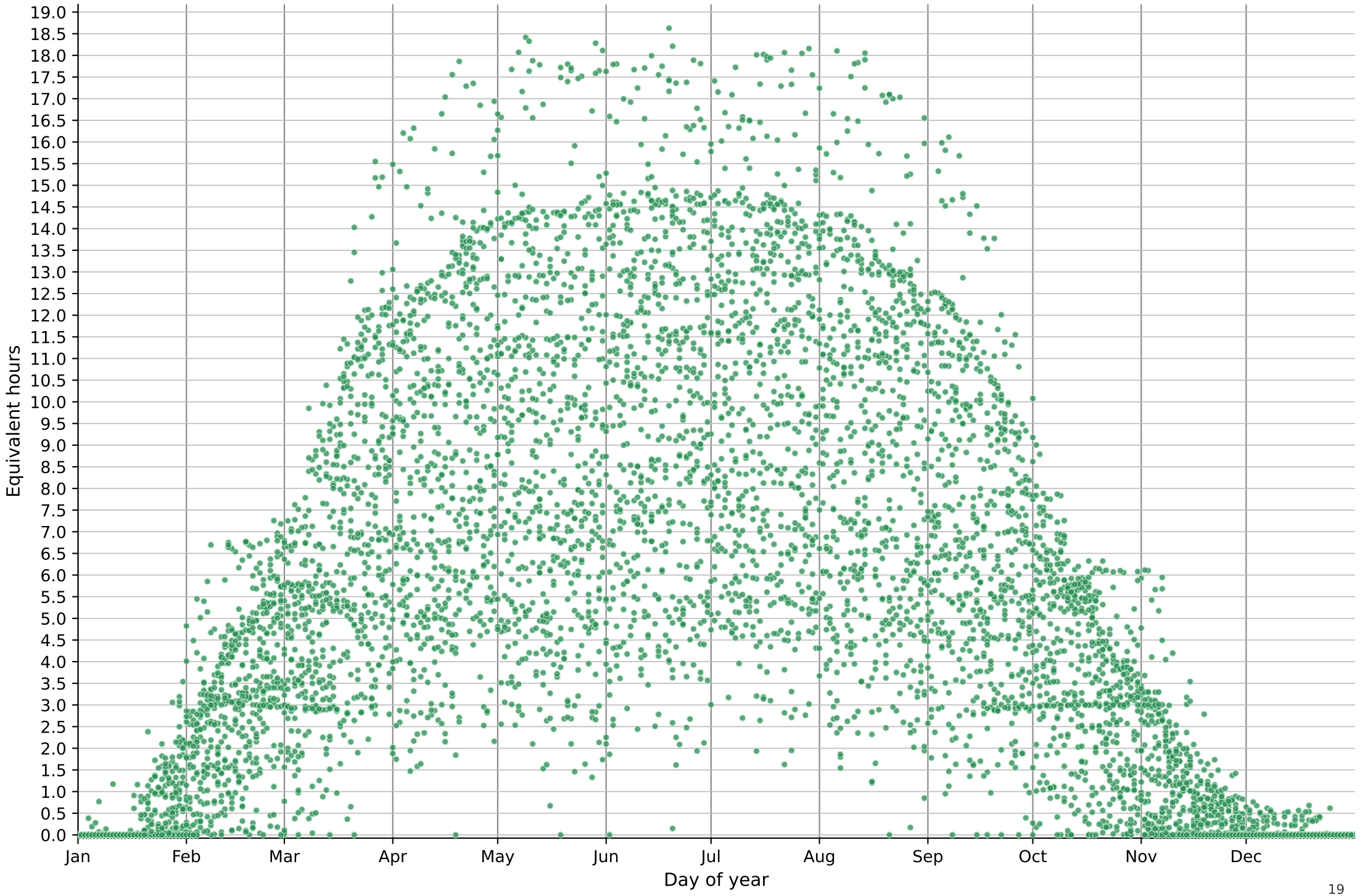
Month / year		Roof East 22°/-90° 19,800 Wp	Roof West 22°/90° 19,800 Wp	Terrace railing south 90°/0° 4,620 Wp	Terrace railing north 90°/180° 4,620 Wp	Garage roof 1°/0° 10,740 Wp	Garage side wall south 90°/0° 3,475 Wp	All together
January	Maximum	356.92	385.92	31.82	31.82	215.41	23.93	1,166.76
	average	284.39	311.36	24.63	24.63	173.24	18.53	930.37
	minimum	209.37	214.07	18.36	18.36	122.51	13.81	666.14
February	Maximum	718.95	1,031.05	49.24	49.24	503.23	37.04	2,462.01
	average	637.67	859.52	37.34	37.34	430.11	28.08	2,188.94
	minimum	510.35	661.54	30.07	30.07	340.12	22.61	1,768.65
March	Maximum	1,896.25	1,999.36	173.75	75.02	1,129.94	130.69	5,657.68
	average	1,368.61	1,446.02	146.85	64.77	806.51	110.45	4,241.28
	minimum	1,067.03	1,139.51	118.74	53.44	627.34	89.31	3,418.95
April	Maximum	2,463.53	2,347.71	362.45	100.37	1,367.24	272.62	7,425.20
	average	1,918.13	1,886.40	282.42	89.06	1,077.61	212.43	5,978.99
	minimum	1,452.70	1,393.15	207.38	74.71	802.88	155.99	4,519.35
May	Maximum	2,543.99	2,425.42	318.29	125.48	1,410.24	239.41	7,718.38
	average	2,105.75	2,033.34	268.55	111.64	1,172.53	201.99	6,516.57
	minimum	1,362.12	1,325.42	172.64	93.76	758.78	129.85	4,293.46
June	Maximum	2,828.04	2,701.94	308.98	129.26	1,575.01	232.41	8,495.77
	average	2,233.11	2,172.99	251.77	113.84	1,252.12	189.37	6,852.53
	minimum	1,666.86	1,769.28	200.07	102.39	972.12	150.48	5,414.71
July	Maximum	2,818.51	2,700.36	328.50	120.75	1,572.39	247.08	8,539.31
	average	2,285.27	2,223.78	271.88	111.41	1,282.29	204.50	7,035.24
	minimum	1,970.94	1,927.16	234.03	92.41	1,108.48	176.03	6,103.31
August	Maximum	2,363.70	2,329.06	334.87	102.93	1,334.09	251.87	7,263.05
	average	2,009.77	1,969.16	285.21	90.42	1,127.46	214.52	6,242.69
	minimum	1,516.68	1,536.71	216.24	81.26	858.96	162.65	4,884.64
September	Maximum	1,868.30	1,837.15	260.75	70.97	1,058.93	196.12	5,636.94
	average	1,492.77	1,472.88	205.76	63.50	845.54	154.77	4,568.23
	minimum	1,262.29	1,158.92	160.83	55.85	699.60	120.97	3,780.35
October	Maximum	1,000.32	1,344.42	51.20	47.32	675.58	38.51	3,314.23
	average	867.28	1,061.43	45.35	42.82	556.59	34.11	2,798.72
	minimum	605.18	706.19	39.68	34.15	375.05	29.84	1,975.01
November	Maximum	411.18	567.30	30.31	30.31	287.34	22.80	1,429.53
	average	363.34	448.44	26.49	26.49	236.02	19.92	1,226.03
	minimum	311.50	363.10	22.18	22.18	194.95	16.68	1,032.52
December	Maximum	260.65	260.65	23.94	23.94	150.95	18.00	828.86
	average	222.88	222.88	20.13	20.13	129.20	15.14	706.64
	minimum	169.03	169.03	14.64	14.64	98.22	11.01	532.05
All years	Maximum	17,060.9	17,253.6	2,017.7	836.6	9,768.4	1,517.6	52,697.6
	average	15,789.0	16,108.2	1,866.4	796.0	9,089.2	1,403.8	49,286.2
	minimum	14,275.1	15,077.9	1,708.4	749.2	8,442.0	1,285.0	45,876.9

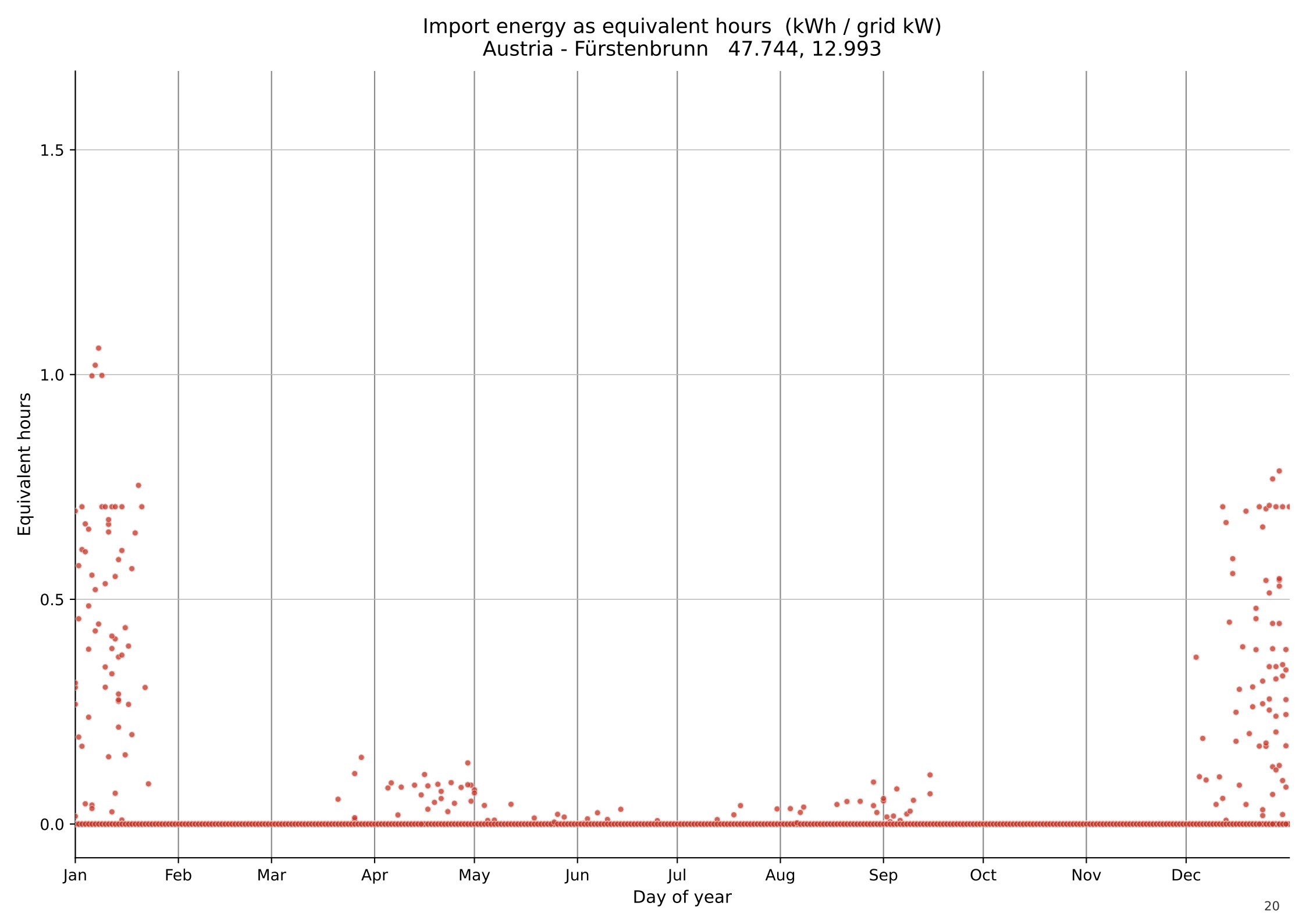
Highest combined yield hour: 2021-06-01 10:10 UTC 41,931.1 W (0.553 W/Wp) of 75,770 Wp installed. Use this hour to size battery charge power.

Monthly and yearly total yield (kWh)
Austria - Fürstenbrunn 47.744, 12.993

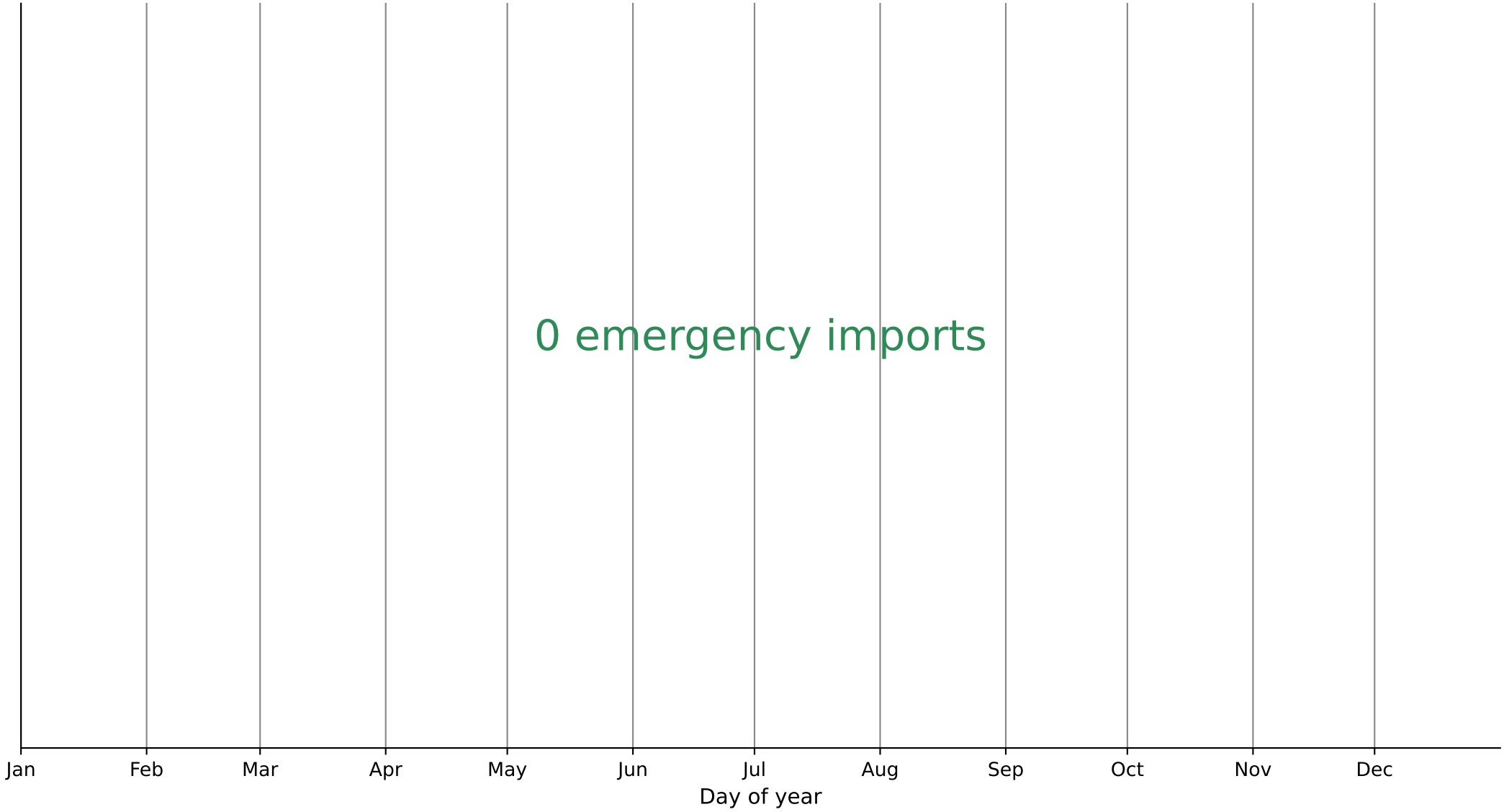
Month / year		Garage side wall north 90°/180° 3,475 Wp	Garage door side west 90°/90° 700 Wp	Garage back side east 90°/-90° 2,540 Wp	Garden fence east 90°/-90° + 90°/90° 6000 Wp bifacial ×80%	All together
January	Maximum	23.93	4.82	17.59	74.60	1,166.76
	average	18.53	3.73	13.61	57.74	930.37
	minimum	13.81	2.78	10.11	42.95	666.14
February	Maximum	37.04	8.47	29.67	128.19	2,462.01
	average	28.08	6.74	23.16	100.91	2,188.94
	minimum	22.61	5.70	19.36	87.20	1,768.65
March	Maximum	56.43	13.35	48.92	207.13	5,657.68
	average	48.72	12.40	45.19	191.77	4,241.28
	minimum	40.20	11.13	41.04	173.28	3,418.95
April	Maximum	75.49	23.77	96.28	390.41	7,425.20
	average	66.99	21.55	82.28	342.12	5,978.99
	minimum	56.20	17.14	68.46	279.25	4,519.35
May	Maximum	94.38	30.65	117.53	475.10	7,718.38
	average	83.97	27.04	97.05	414.71	6,516.57
	minimum	70.52	18.96	68.82	292.59	4,293.46
June	Maximum	97.23	31.23	118.66	493.44	8,495.77
	average	85.63	27.45	100.54	425.71	6,852.53
	minimum	77.02	24.16	81.06	357.36	5,414.71
July	Maximum	90.83	31.13	126.62	512.58	8,539.31
	average	83.80	26.96	107.22	438.13	7,035.24
	minimum	69.51	22.42	95.06	378.28	6,103.31
August	Maximum	77.42	24.75	103.20	411.26	7,263.05
	average	68.01	23.02	88.42	366.70	6,242.69
	minimum	61.12	19.85	74.81	313.67	4,884.64
September	Maximum	53.38	16.35	58.75	250.87	5,636.94
	average	47.76	14.47	51.03	219.76	4,568.23
	minimum	42.01	11.53	42.96	181.49	3,780.35
October	Maximum	35.59	7.99	32.16	130.77	3,314.23
	average	32.21	7.42	29.94	121.58	2,798.72
	minimum	25.68	6.20	26.17	106.17	1,975.01
November	Maximum	22.80	5.04	16.99	74.67	1,429.53
	average	19.92	4.41	15.09	65.90	1,226.03
	minimum	16.68	3.80	12.54	55.67	1,032.52
December	Maximum	18.00	3.63	13.16	55.95	828.86
	average	15.14	3.05	11.06	47.05	706.64
	minimum	11.01	2.22	8.05	34.21	532.05
All years	Maximum	629.2	187.5	715.0	2,967.0	52,697.6
	average	598.7	178.2	664.6	2,792.1	49,286.2
	minimum	563.5	168.8	623.0	2,641.7	45,876.9

Highest combined yield hour: 2021-06-01 10:10 UTC 41,931.1 W (0.553 W/Wp) of 75,770 Wp installed. Use this hour to size battery charge power.


Export energy as equivalent hours (kWh / grid kW)
Austria - Fürstenbrunn 47.744, 12.993
Equivalent hours
19.0
18.5
18.0
17.5
17.0
16.5
16.0
15.5
15.0
14.5
14.0
13.5
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)
Austria - Fürstenbrunn 47.744, 12.993
Equivalent hours
1.5
1.0
0.5
0.0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Day of year

Emergency import hours: 0 days with an emergency: 0
Austria - Fürstenbrunn 47.744, 12.993



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
Austria - Fürstenbrunn 47.744, 12.993

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	All
Export to grid													
month Maximum	293	1,731	4,543	5,550	5,565	6,167	6,375	5,465	4,486	2,413	648	78	38,129
month average	134	1,432	3,273	4,432	4,768	5,055	5,268	4,757	3,549	1,951	473	19	35,112
month minimum	0	1,033	2,537	3,173	3,267	4,148	4,415	3,812	2,852	1,180	288	0	32,684
day Maximum	60.2	123.4	264.3	303.7	313.1	316.7	308.7	307.8	273.9	171.3	104.0	12.9	316.7
day average	4.3	50.8	105.6	147.7	153.8	168.5	169.9	153.4	118.3	62.9	15.8	0.6	96.1
day minimum	0.0	0.0	0.0	0.0	0.0	0.0	27.6	0.0	0.0	0.0	0.0	0.0	0.0
Import from grid													
month Maximum	166	0	3	4	1	1	1	2	2	0	0	104	263
month average	27	0	0	1	0	0	0	0	0	0	0	22	52
month minimum	0	0	0	0	0	0	0	0	0	0	0	0	0
day Maximum	18.0	0.0	2.5	2.3	1.3	0.6	0.7	1.6	1.9	0.0	0.0	13.4	18.0
day average	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.1
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
Total energy used for house													
month Maximum	750	695	693	623	601	534	537	549	564	624	665	726	7,348
month average	712	636	667	597	572	515	514	520	537	602	634	697	7,204
month minimum	683	610	643	560	542	491	496	498	507	574	608	665	7,080
day Maximum	26.4	26.5	25.1	23.2	22.4	22.2	20.8	21.1	21.2	23.0	24.8	26.0	26.5
day average	23.0	22.6	21.5	19.9	18.5	17.2	16.6	16.8	17.9	19.4	21.1	22.5	19.7
day minimum	15.9	20.5	18.4	15.4	15.3	15.3	15.2	15.2	15.2	16.7	18.5	20.4	15.2

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
Austria - Fürstenbrunn 47.744, 12.993

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	All
Export													
month Maximum	60	308	645	575	587	600	619	594	543	443	132	15	4,680
month average	27	264	506	510	529	534	560	540	480	364	96	4	4,414
month minimum	0	192	410	419	431	467	495	483	401	225	60	0	4,143
day Maximum	12.9	24.0	31.0	28.8	29.5	32.5	31.6	31.1	28.1	27.1	22.4	2.8	32.5
day average	0.9	9.4	16.3	17.0	17.1	17.8	18.1	17.4	16.0	11.7	3.2	0.1	12.1
day minimum	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0
Import													
month Maximum	39	0	1	1	0	0	0	1	1	0	0	24	61
month average	6	0	0	0	0	0	0	0	0	0	0	5	12
month minimum	0	0	0	0	0	0	0	0	0	0	0	0	0
day Maximum	4.5	0.0	0.7	0.6	0.3	0.2	0.2	0.6	0.6	0.0	0.0	2.9	4.5
day average	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	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	13	0	10	10	8	3	4	7	7	0	0	13	56
month average	5	0	1	6	1	0	1	2	2	0	0	5	24
month minimum	0	0	0	0	0	0	0	0	0	0	0	0	2
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	52	0	11	11	9	3	4	8	7	0	0	37	89
month average	12	0	1	6	1	0	1	2	2	0	0	10	36
month minimum	0	0	0	0	0	0	0	0	0	0	0	0	2
day Maximum	4.5	0.0	0.7	0.6	0.3	0.2	0.2	0.6	0.6	0.0	0.0	2.9	4.5
day average	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	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	46	308	645	567	587	600	619	594	539	443	132	15	4,649
month average	15	264	505	504	528	534	560	538	478	364	96	-7	4,379
month minimum	-50	192	410	408	430	466	495	483	401	225	60	-37	4,121
day Maximum	12.9	24.0	31.0	28.8	29.5	32.5	31.6	31.1	28.1	27.1	22.4	2.8	32.5
day average	0.7	9.4	16.3	17.0	17.1	17.8	18.1	17.4	16.0	11.7	3.2	-0.0	12.1
day minimum	-4.5	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	-2.9	-4.5

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
Austria - Fürstenbrunn 47.744, 12.993

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	All
Export total													
month Maximum	293	1,731	4,543	5,550	5,565	6,167	6,375	5,465	4,486	2,413	648	78	38,129
month average	134	1,432	3,273	4,432	4,768	5,055	5,268	4,757	3,549	1,951	473	19	35,112
month minimum	0	1,033	2,537	3,173	3,267	4,148	4,415	3,812	2,852	1,180	288	0	32,684
day Maximum	60.2	123.4	264.3	303.7	313.1	316.7	308.7	307.8	273.9	171.3	104.0	12.9	316.7
day average	4.3	50.8	105.6	147.7	153.8	168.5	169.9	153.4	118.3	62.9	15.8	0.6	96.1
day minimum	0.0	0.0	0.0	0.0	0.0	0.0	27.6	0.0	0.0	0.0	0.0	0.0	0.0
Export during high price hours													
month Maximum	285	1,478	2,504	2,015	2,070	1,870	1,985	2,051	2,164	2,191	630	78	17,699
month average	128	1,240	2,151	1,883	1,869	1,776	1,889	1,920	1,982	1,789	460	19	17,107
month minimum	0	892	1,903	1,779	1,694	1,649	1,814	1,831	1,795	1,149	281	0	15,941
day Maximum	57.8	101.3	99.2	91.7	94.3	94.3	92.8	96.2	100.3	100.0	100.6	12.9	101.3
day average	4.1	43.9	69.4	62.8	60.3	59.2	60.9	61.9	66.1	57.7	15.3	0.6	46.8
day minimum	0.0	0.0	0.0	0.0	0.0	0.0	26.2	0.0	0.0	0.0	0.0	0.0	0.0
Export during medium price hours													
month Maximum	15	253	1,768	3,020	3,207	3,493	3,736	3,045	2,155	265	26	1	17,517
month average	6	192	992	2,162	2,453	2,774	2,878	2,439	1,414	162	14	0	15,485
month minimum	0	123	460	1,215	1,288	2,111	2,195	1,660	837	30	6	0	13,678
day Maximum	3.4	24.0	172.0	194.7	202.8	199.2	203.7	204.0	181.8	81.8	6.7	0.7	204.0
day average	0.2	6.8	32.0	72.1	79.1	92.5	92.9	78.7	47.1	5.2	0.5	0.0	42.4
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	0	0	295	660	742	843	826	607	277	0	0	0	3,146
month average	0	0	130	387	446	505	501	398	153	0	0	0	2,520
month minimum	0	0	29	119	121	266	354	102	84	0	0	0	1,825
day Maximum	0.0	0.0	34.0	51.0	60.4	64.7	51.7	51.0	34.0	0.0	0.0	0.0	64.7
day average	0.0	0.0	4.2	12.9	14.4	16.8	16.1	12.8	5.1	0.0	0.0	0.0	6.9
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
Austria - Fürstenbrunn 47.744, 12.993

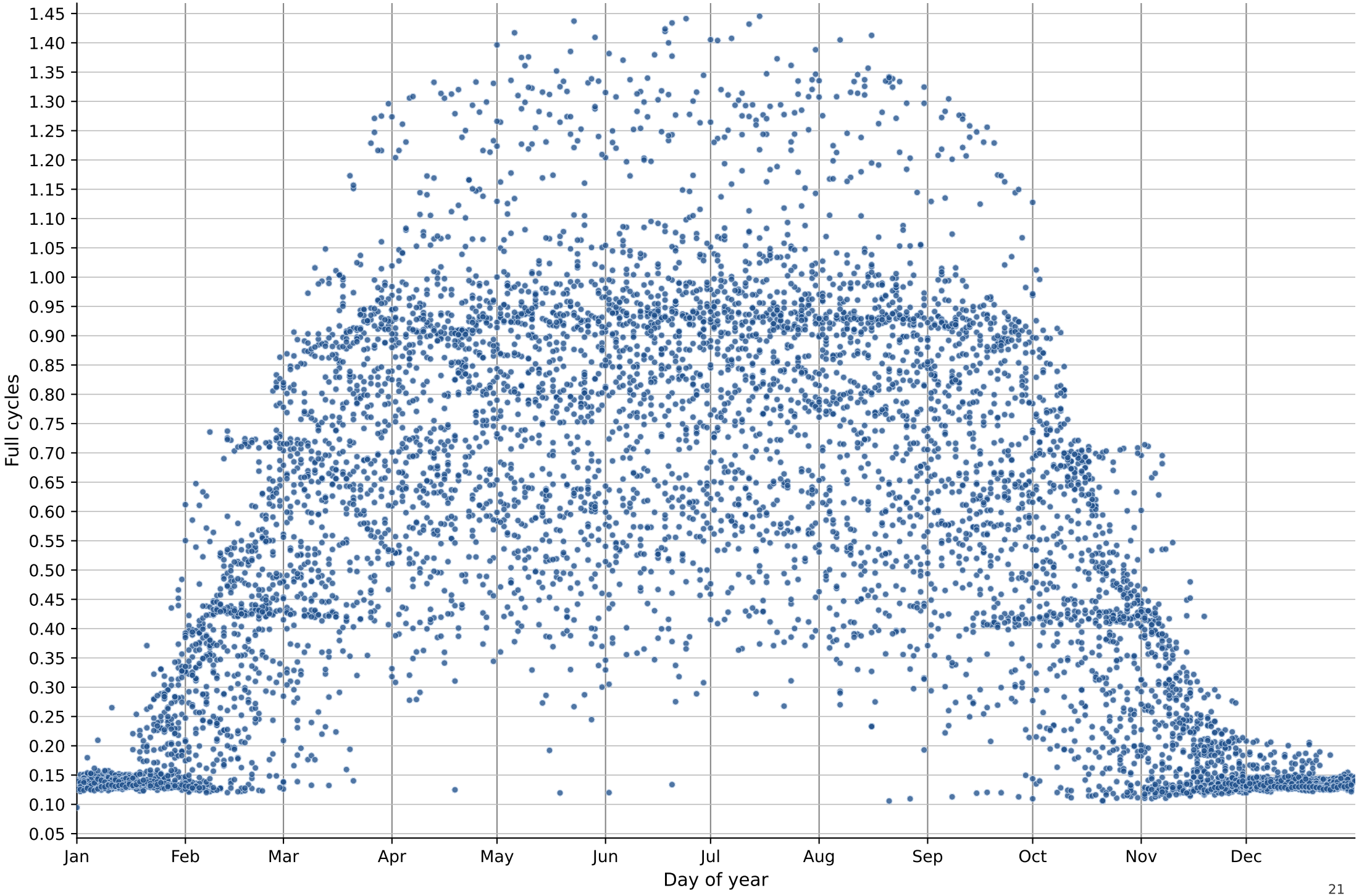
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	All
Heating													
month Maximum	258	235	201	151	115	67	59	70	98	137	192	237	1,630
month average	219	188	175	127	89	50	38	44	73	117	161	208	1,489
month minimum	190	165	152	92	61	29	23	23	46	91	136	176	1,377
day Maximum	10.6	10.6	9.2	7.5	6.9	6.7	5.4	5.7	5.5	7.3	9.1	10.2	10.6
day average	7.1	6.7	5.6	4.2	2.9	1.7	1.2	1.4	2.4	3.8	5.4	6.7	4.1
day minimum	0.0	4.7	2.8	0.0	0.0	0.0	0.0	0.0	0.0	1.3	2.9	4.6	0.0
Cooling													
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
DHW													
month Maximum	59	55	59	52	52	47	44	45	46	53	53	55	608
month average	59	53	58	51	49	45	42	43	44	52	52	55	602
month minimum	59	52	57	47	47	42	40	41	41	49	51	55	592
day Maximum	1.9	1.9	1.9	1.8	1.8	1.8	1.7	1.7	1.7	1.8	1.8	1.8	1.9
day average	1.9	1.9	1.9	1.7	1.6	1.5	1.3	1.4	1.5	1.7	1.7	1.8	1.6
day minimum	1.8	1.8	1.6	1.4	1.3	1.3	1.2	1.2	1.2	1.4	1.6	1.7	1.2
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

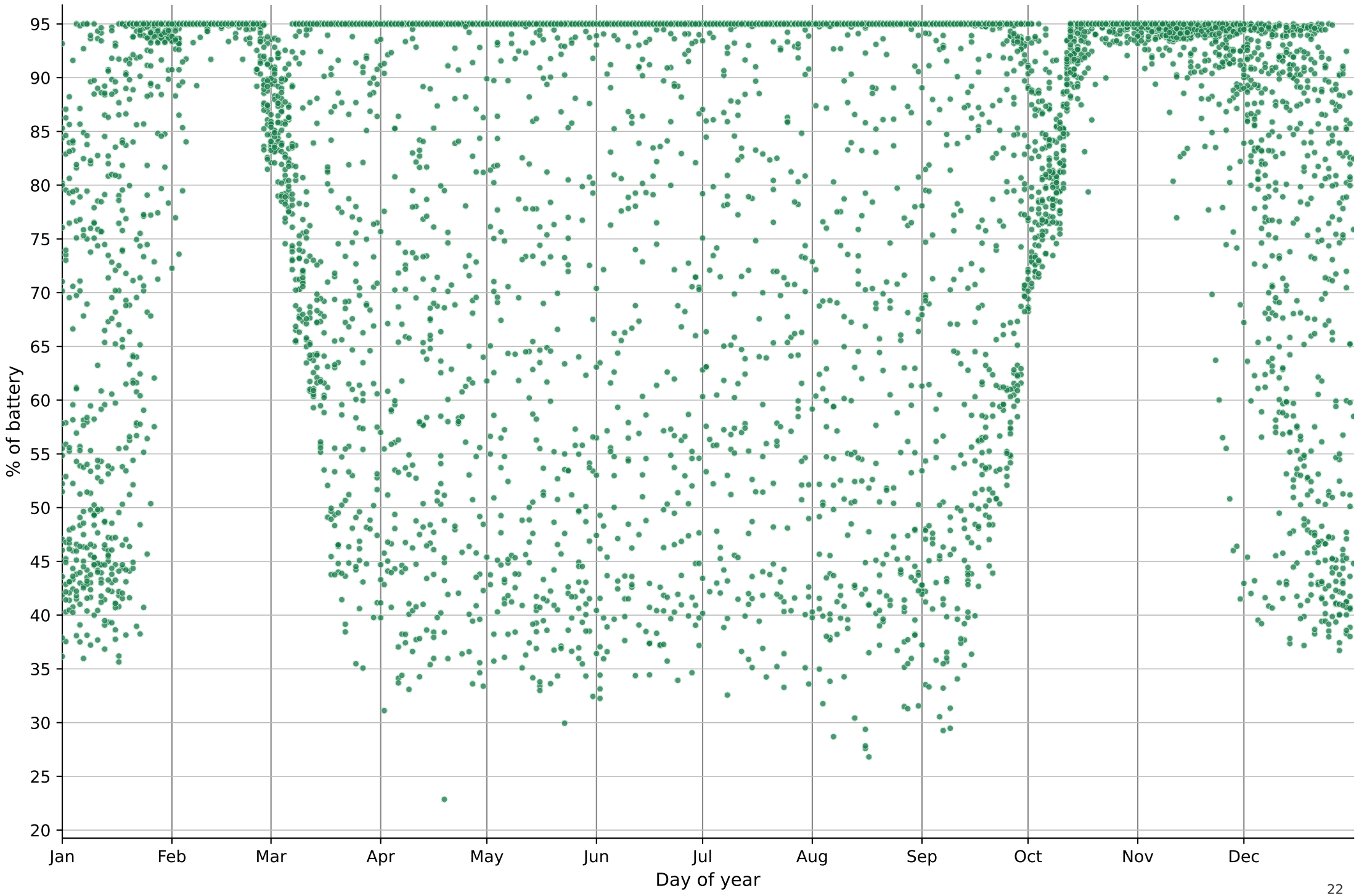
Heating, cooling and DHW are electricity. Direct electric is the part the heat pump could not cover.

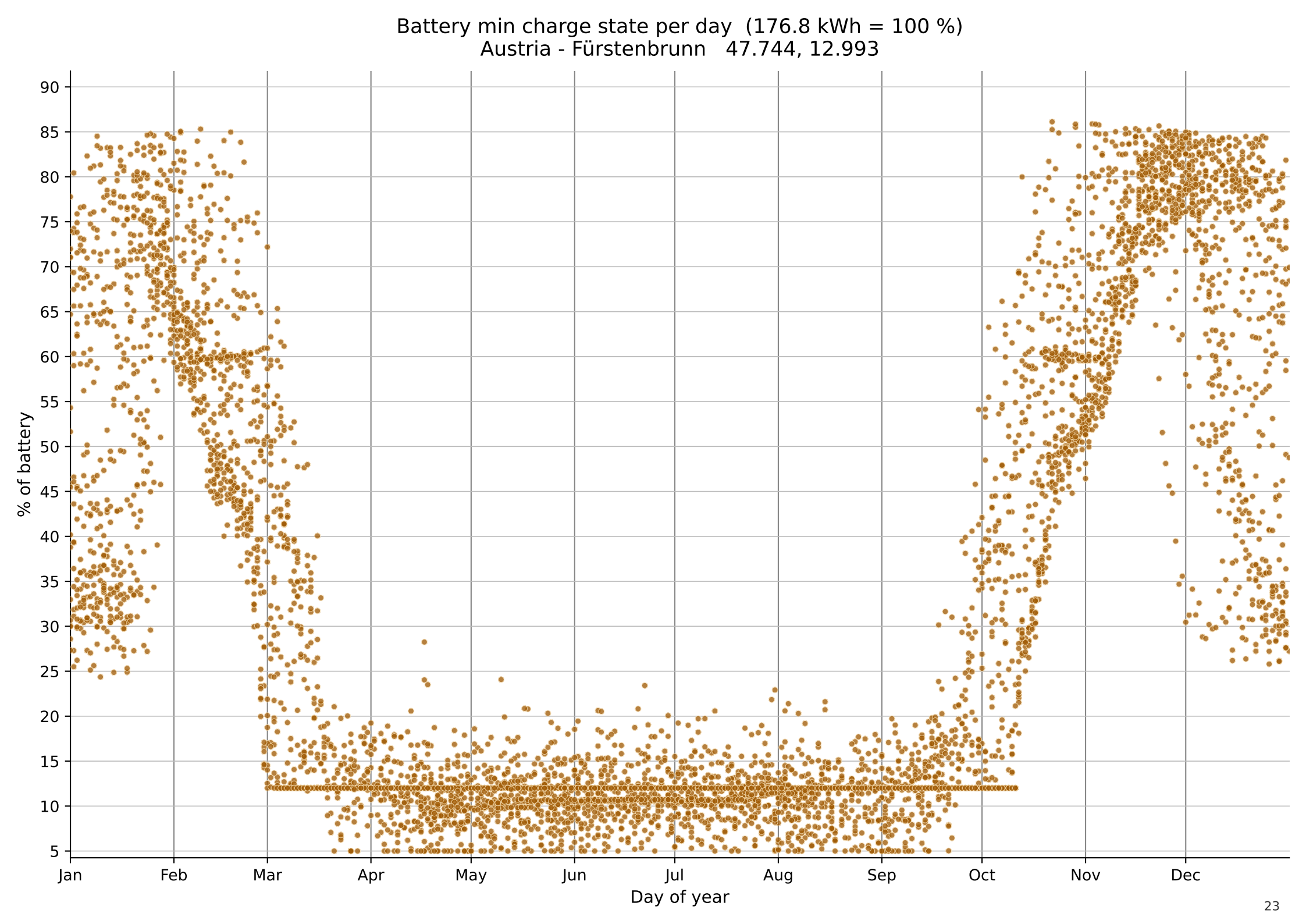
Battery
Austria - Fürstenbrunn 47.744, 12.993

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	All
Wasted													
month Maximum	0	0	121	1,141	1,241	1,461	1,391	946	267	0	0	0	4,821
month average	0	0	56	610	827	931	875	622	135	0	0	0	4,055
month minimum	0	0	4	294	170	480	507	221	67	0	0	0	3,151
day Maximum	0.0	0.0	33.0	130.0	136.8	134.7	132.1	107.4	55.8	0.0	0.0	0.0	136.8
day average	0.0	0.0	1.8	20.3	26.7	31.0	28.2	20.1	4.5	0.0	0.0	0.0	11.1
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	6	12	26	27	28	27	29	26	24	17	7	5	220
month average	5	11	21	23	25	25	26	24	21	15	6	4	207
month minimum	4	9	18	19	20	22	23	21	18	10	5	4	200
day Maximum	0.5	0.9	1.3	1.3	1.4	1.4	1.4	1.4	1.3	1.1	0.7	0.2	1.4
day average	0.2	0.4	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.5	0.2	0.1	0.6
day minimum	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1
Charge C													
month Maximum	0	0	0	0	0	0	0	0	0	0	0	0	2
month average	0	0	0	0	0	0	0	0	0	0	0	0	2
month minimum	0	0	0	0	0	0	0	0	0	0	0	0	2
day Maximum	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.2
day average	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.1
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
Discharge C													
month Maximum	0	0	0	0	0	0	0	0	0	0	0	0	1
month average	0	0	0	0	0	0	0	0	0	0	0	0	1
month minimum	0	0	0	0	0	0	0	0	0	0	0	0	1
day Maximum	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
day average	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
day minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0

Wasted = PV left when the export price is negative and the battery is full. Full cycles = discharge kWh / 176.8 kWh. Battery export only into hours whose export price is above 0, highest price first. At 0 cent on


Battery cycles per day (discharge / 176.8 kWh)
Austria - Fürstenbrunn 47.744, 12.993
Full cycles
1.45
1.40
1.35
1.30
1.25
1.20
1.15
1.10
1.05
1.00
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 (176.8 kWh = 100 %)
Austria - Fürstenbrunn 47.744, 12.993
% 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 (176.8 kWh = 100 %)
Austria - Fürstenbrunn 47.744, 12.993
% of battery
90
85
80
75
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