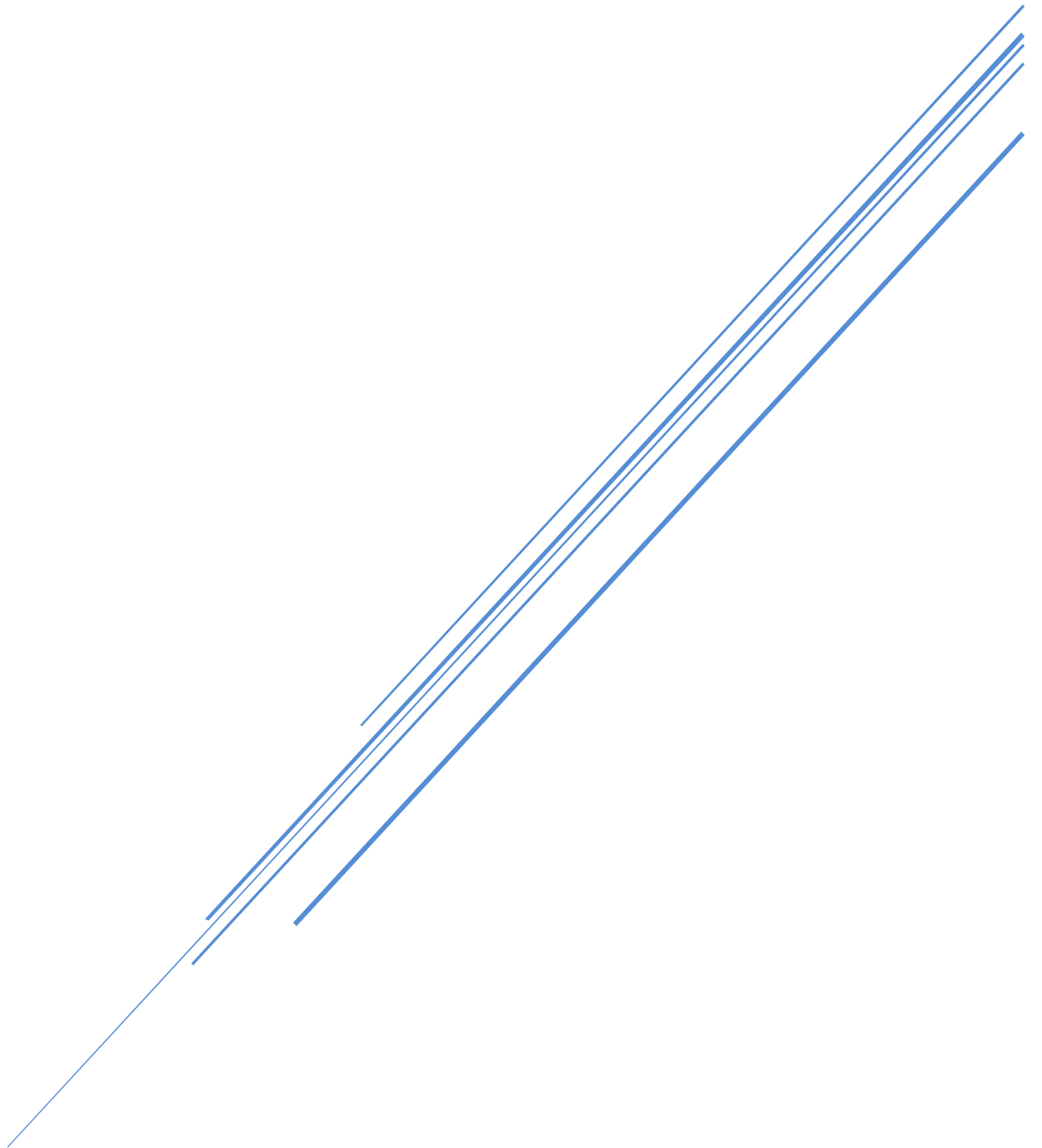


POWER OF THE SUN

Case study of 3 kW rooftop solar power system





Grid-Connect Solar Energy Solutions

Shaktisteller Solar systems – numero uno in solar installations

Energy Efficiency installers trust the expertise of SSE energy systems to deliver & install their renewable energy products, photovoltaic systems and components with no exception to metering solutions and different department liaisons.

Expert client consultation

Customer service and added value are at the top of our priority list. SSE Energy Solution's dedicated technical team offers each customer expert technical solution to any photovoltaic scheme you may encounter.

Trusted Brands form world's leading manufacturers

We offer our customers a wide selection of high efficiency solar modules, inverters and accessories for grid-connect systems from world class manufacturers. Custom mounting structure as per site requirement and customer demand is made available by our trained professionals. We offer the best product at the most competitive price & ensure your supply chain and management service is a pleasant experience.

- **Mounting systems**
- **Inverter string configurations**
- **Product specifications & recommendations**
- **Yield calculation projection**
- **In house photovoltaic system designs**

Adhering to MNRE Compliance

SSE energy solution product management & technical team operate alongside our suppliers on product quality and service, every component is carefully selected on its technical performance, longevity and warranty for a better customer experience.



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Expert photovoltaics support

Our Solar Photovoltaic team are always happy to help with any queries that you may have. Whether it be a sales order or a more technical question, feel free to contact our team and we will ensure highest quality of service to you.

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2 C, Saket Nagar (AIIMS)
Bhopal (M.P.)

Tel: +91 755 4200887

Mob : +91 9425019265

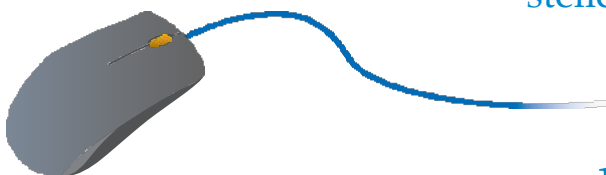
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www.shaktisteller.com

3 KW SOLAR PV PLANT WITH NET METERING

Case Study

Residential Consumer, Bhopal

Installation	
Property Type:	Residential House 10kW load
Installer:	Shaktisteller ESPL
Property Location:	Chunabhatti, Bhopal
Roof Orientation:	South

Photovoltaic System	
Module Type:	Anchor Panasonic 260 W _p mono
PV System Size:	3 kW _p
Inverter:	Growatt, 3000-s, 3 kW _p Grid connect
Mounting System:	VIRIDIS, on-roof
Generation per month:	395 kWh





Project : **Grid-Connected Project at Bhopal**

Geographical Site **Bhopal** **Country** **India**

Latitude 23.3°N Longitude 77.6°E
 Legal Time Time zone UT+6 Altitude 521 m
 Albedo 0.30

Meteo data : Bhopal, Synthetic Hourly data

Collector Plane Orientation Tilt 23° Azimuth 0°

Horizon Free Horizon

Near Shadings No Shadings

PV Array Characteristics

PV module Si-poly Model **AE6P250WB3A**

Manufacturer PANASONIC

Number of PV modules In series 12 modules In parallel 1 strings

Total number of PV modules Nb. modules 12 Unit Nom. Power 250 Wp

Array global power Nominal (STC) **3.0 kWp** At operating cond. 2.71 kWp (50°C)

Array operating characteristics (50°C) U mpp 339 V I mpp 8 A

Total area Module area **19.5 m²** Cell area 17.5 m²

Inverter Model **GROWATT 3000-S**

Manufacturer SHENZEN GROWATT

Characteristics Operating Voltage 70-500 V Unit Nom. Power 3.0 kW AC

PV Array loss factors

Thermal Loss factor U_c (const) 29.0 W/m²K U_v (wind) 0.0 W/m²K / m/s
 => Nominal Oper. Coll. Temp. (G=800 W/m², T_{amb}=20°C, Wind velocity = 1m/s.) NOCT 45 °C

Wiring Ohmic Loss Global array res. 702 mOhm Loss Fraction 1.5 % at STC

Module Quality Loss Loss Fraction 2.5 %

Module Mismatch Losses Loss Fraction 2.0 % at MPP

Incidence effect, ASHRAE parametrization IAM = 1 - bo (1/cos i - 1) bo Parameter 0.05



10.2kWh
Energy today

155kWh
Lifetime energy

Daily power chart(W)

Time:7.15
Value:593.2



2017-05-09

Sun

Mon

Tue

Wed

Thu

Fri

Sat

7

8

9

10

11

12

13

- ⊙ 424.1W 7:05
- ⊙ 677.09W 7:10
- ⊙ 593.2W 7:15
- ⊙ 610.0W 7:20
- ⊙ 626.5W 7:25
- ⊙ 656.0W 7:30
- ⊙ 694.9W 7:35
- ⊙ 823.5W 7:40
- ⊙ 482.1W 7:45
- ⊙ 532.29W 7:50
- ⊙ 1085.5W 7:55
- ⊙ 1196.3W 8:00
- ⊙ 1270.9W 8:05

2017-05-09

Sun

Mon

Tue

Wed

Thu

Fri

Sat

7

8

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11

12

13

⊙ 1270.9W 8:05

⊙ 1047.0W 8:10

⊙ 808.09W 8:15

⊙ 1293.59W 8:20

⊙ 1544.4W 8:25

⊙ 1402.65W 8:30

⊙ 1205.5W 8:35

⊙ 757.09W 8:40

⊙ 1243.09W 8:45

⊙ 1309.8W 8:50

⊙ 1341.59W 8:55

⊙ 1324.8W 9:00

⊙ 1314.8W 9:05

⊙ 1044.0W 8:10

2017-05-09

Sun

Mon

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Thu

Fri

Sat

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11

12

13

⊙ 1314.8W 9:05

⊙ 1244.3W 9:10

⊙ 1310.4W 9:15

⊙ 1282.59W 9:20

⊙ 1359.3W 9:25

⊙ 1427.8W 9:30

⊙ 1498.0W 9:35

⊙ 1553.4W 9:40

⊙ 1696.9W 9:45

⊙ 1874.8W 9:50

⊙ 1947.09W 9:55

⊙ 1974.59W 10:00

⊙ 1991.19W 10:05

⊙ 1088.3W 10:10

2017-05-09

Sun

Mon

Tue

Wed

Thu

Fri

Sat

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13

1991.19W 10:05

1988.3W 10:10

1996.5W 10:15

2017.09W 10:20

2034.9W 10:25

2005.59W 10:30

2052.89W 10:35

2081.3W 10:40

2153.19W 10:45

2200.8W 10:50

2241.1W 10:55

2250.0W 11:00

2322.0W 11:05

2342.1W 11:10

2017-05-09

Sun

Mon

Tue

Wed

Thu

Fri

Sat

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13

- ⊙ 2322.0W 11:05
- ⊙ 2343.1W 11:10
- ⊙ 2346.5W 11:15
- ⊙ 2334.69W 11:20
- ⊙ 2334.3W 11:25
- ⊙ 2319.6W 11:30
- ⊙ 2352.19W 11:35
- ⊙ 2346.8W 11:40
- ⊙ 2328.6W 11:45
- ⊙ 2345.1W 11:50
- ⊙ 2167.5W 11:55
- ⊙ 2308.3W 12:00
- ⊙ 2334.89W 12:05

Sun

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Sat

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- ⊙ 2334.89W 12:05
- ⊙ 2317.0W 12:10
- ⊙ 2319.3W 12:15
- ⊙ 2329.6W 12:20
- ⊙ 2309.5W 12:25
- ⊙ 2290.89W 12:30
- ⊙ 2242.5W 12:35
- ⊙ 2558.69W 12:40
- ⊙ 2024.09W 12:45
- ⊙ 2467.6W 12:50
- ⊙ 2246.69W 12:55
- ⊙ 2084.3W 13:00
- ⊙ 865.7W 13:05

Sun

Mon

Tue

Wed

Thu

Fri

Sat

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- ⊙ 2558.69W 12:40
- ⊙ 2024.09W 12:45
- ⊙ 2467.6W 12:50
- ⊙ 2246.69W 12:55
- ⊙ 2084.3W 13:00
- ⊙ 865.7W 13:05
- ⊙ 1887.59W 13:10
- ⊙ 1719.19W 13:15
- ⊙ 1686.19W 13:20
- ⊙ 840.9W 13:25
- ⊙ 2311.3W 13:30
- ⊙ 2256.39W 13:35
- ⊙ 2190.39W 13:40



Solar energy

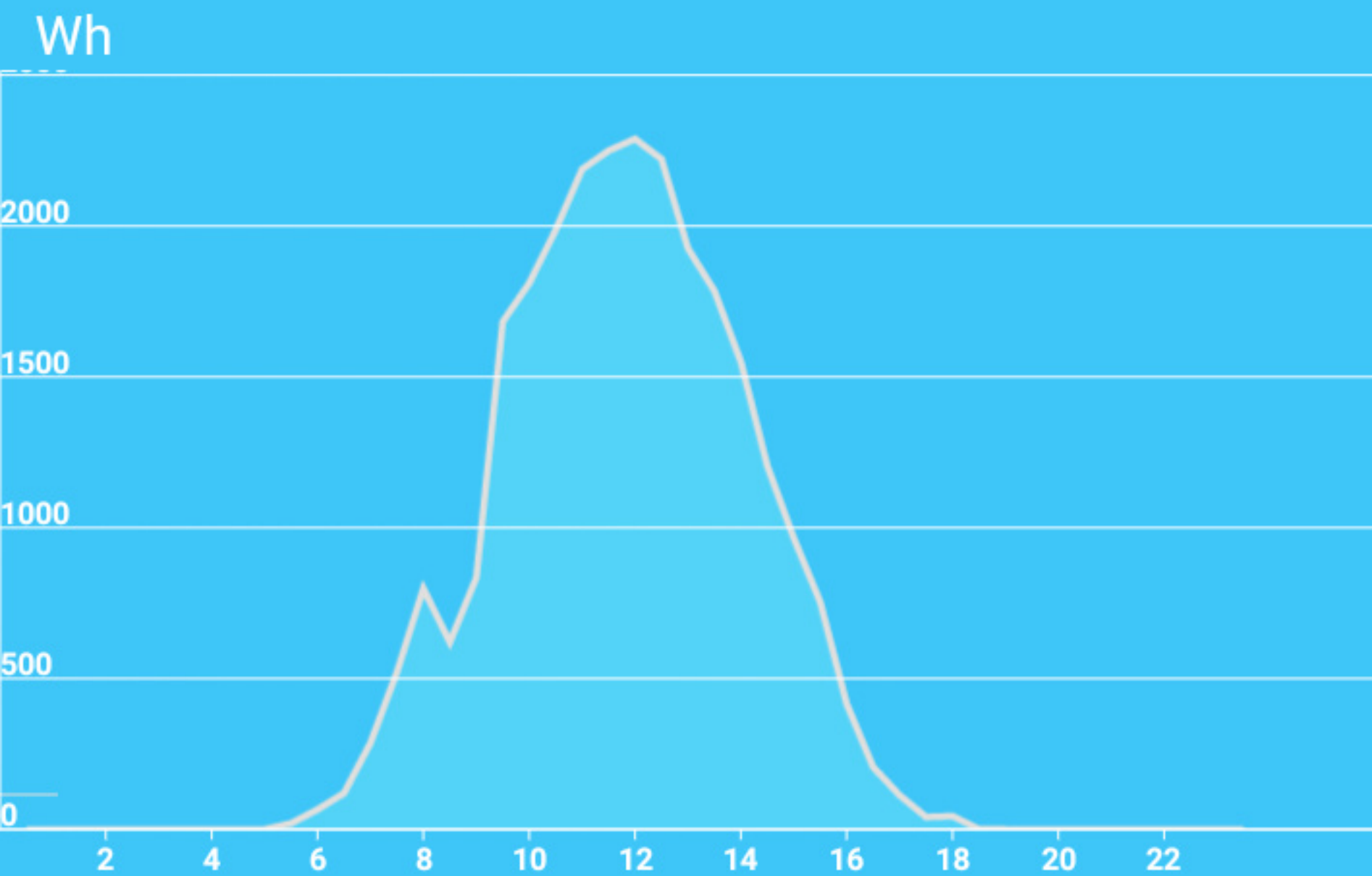
DAY

MONTH

YEAR

TOTAL

◀ 2017-05-12 ▶



Energy yield

18.8 kWh

Max value

2288.85Wh

Average value

556.33Wh



Solar energy

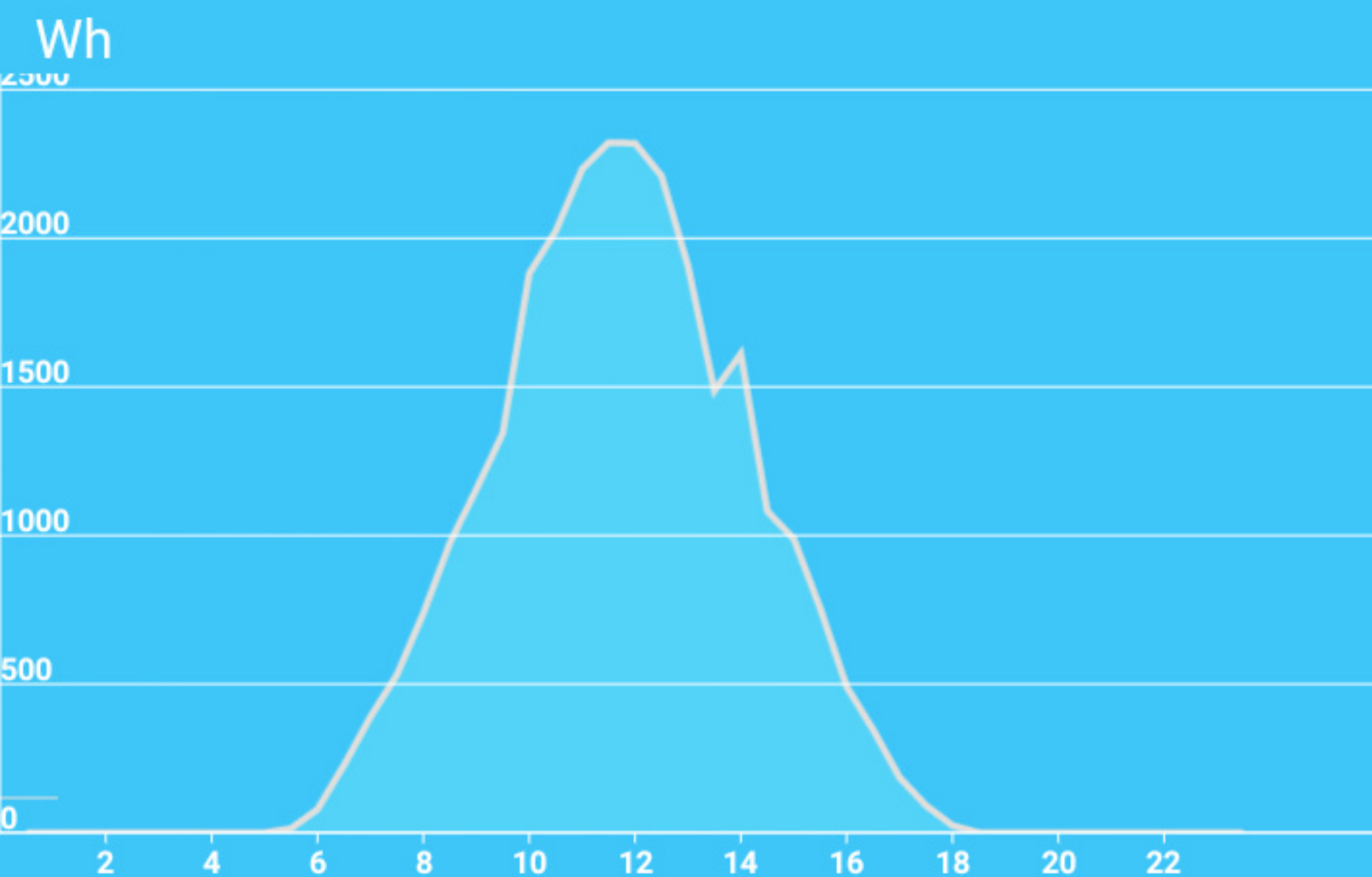
DAY

MONTH

YEAR

TOTAL

◀ 2017-05-10 ▶



Energy yield

13.7 kWh

Max value

2321.18Wh

Average value

571.05Wh



Solar energy

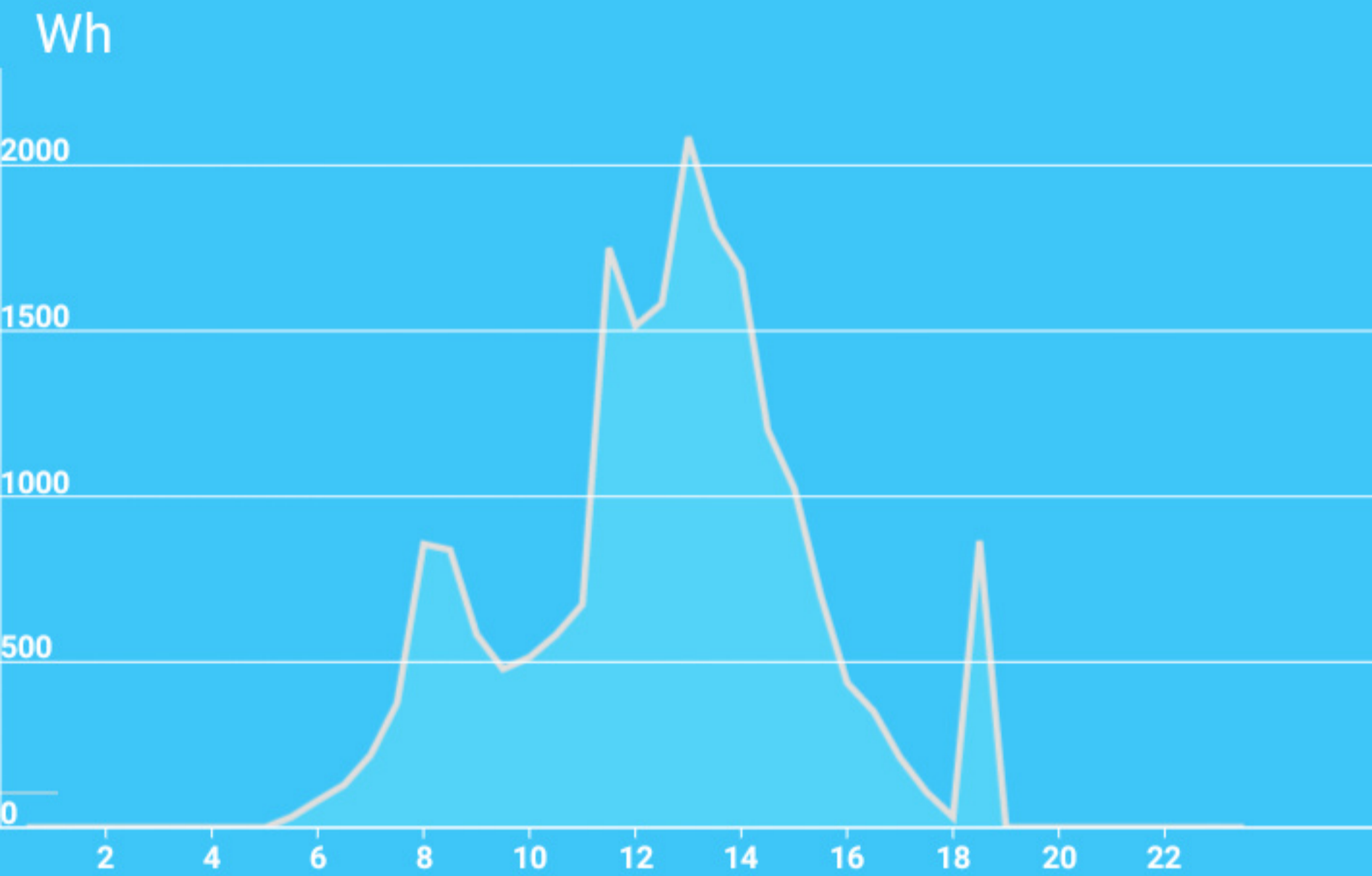
DAY

MONTH

YEAR

TOTAL

◀ 2017-05-11 ▶



Energy yield

4.6 kWh

Max value

2085.77Wh

Average value

431.94Wh



Solar energy

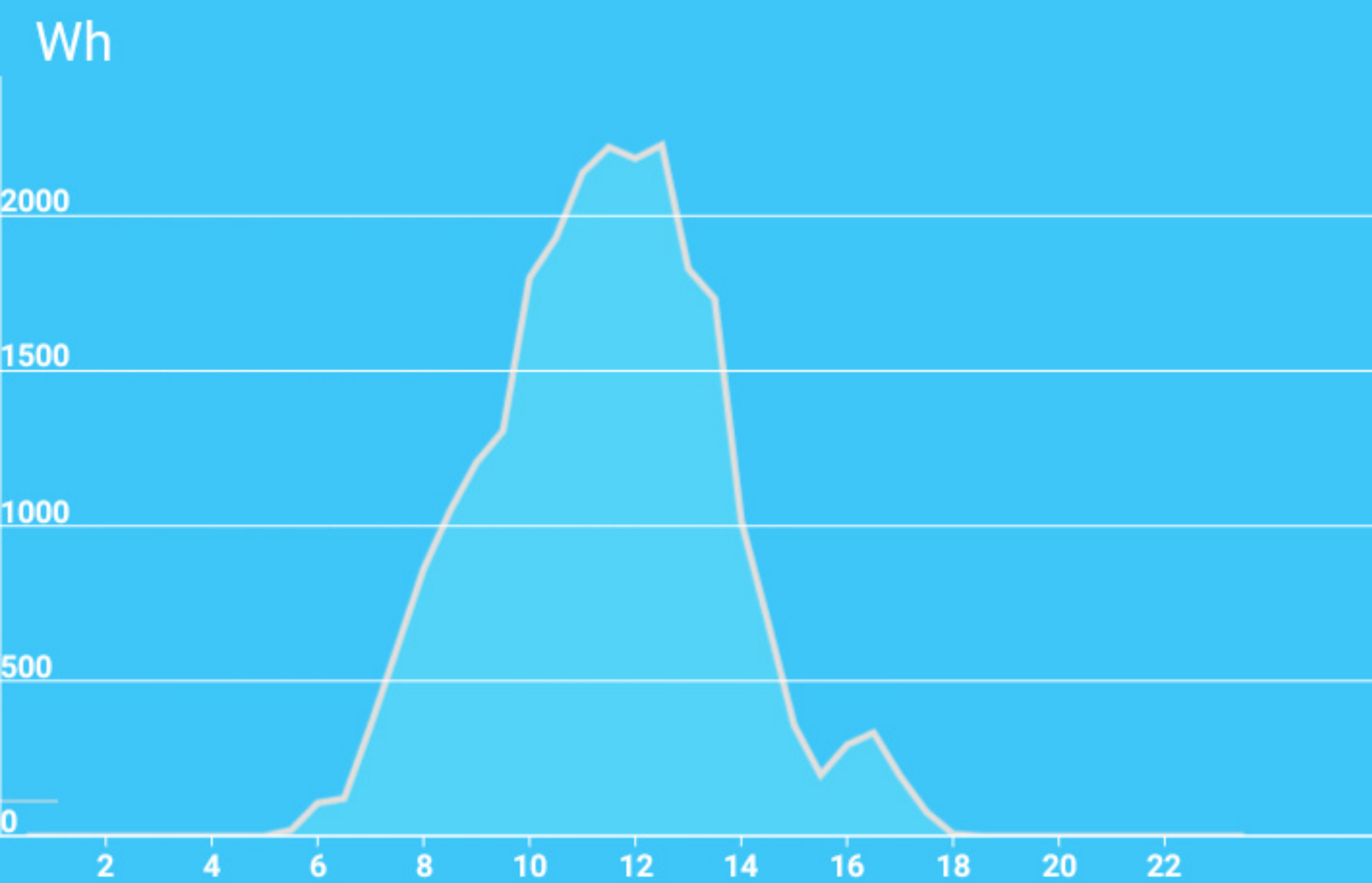
DAY

MONTH

YEAR

TOTAL

◀ 2017-05-09 ▶



Energy yield

12.4 kWh

Max value

2228.98Wh

Average value

518.14Wh



Solar energy

DAY

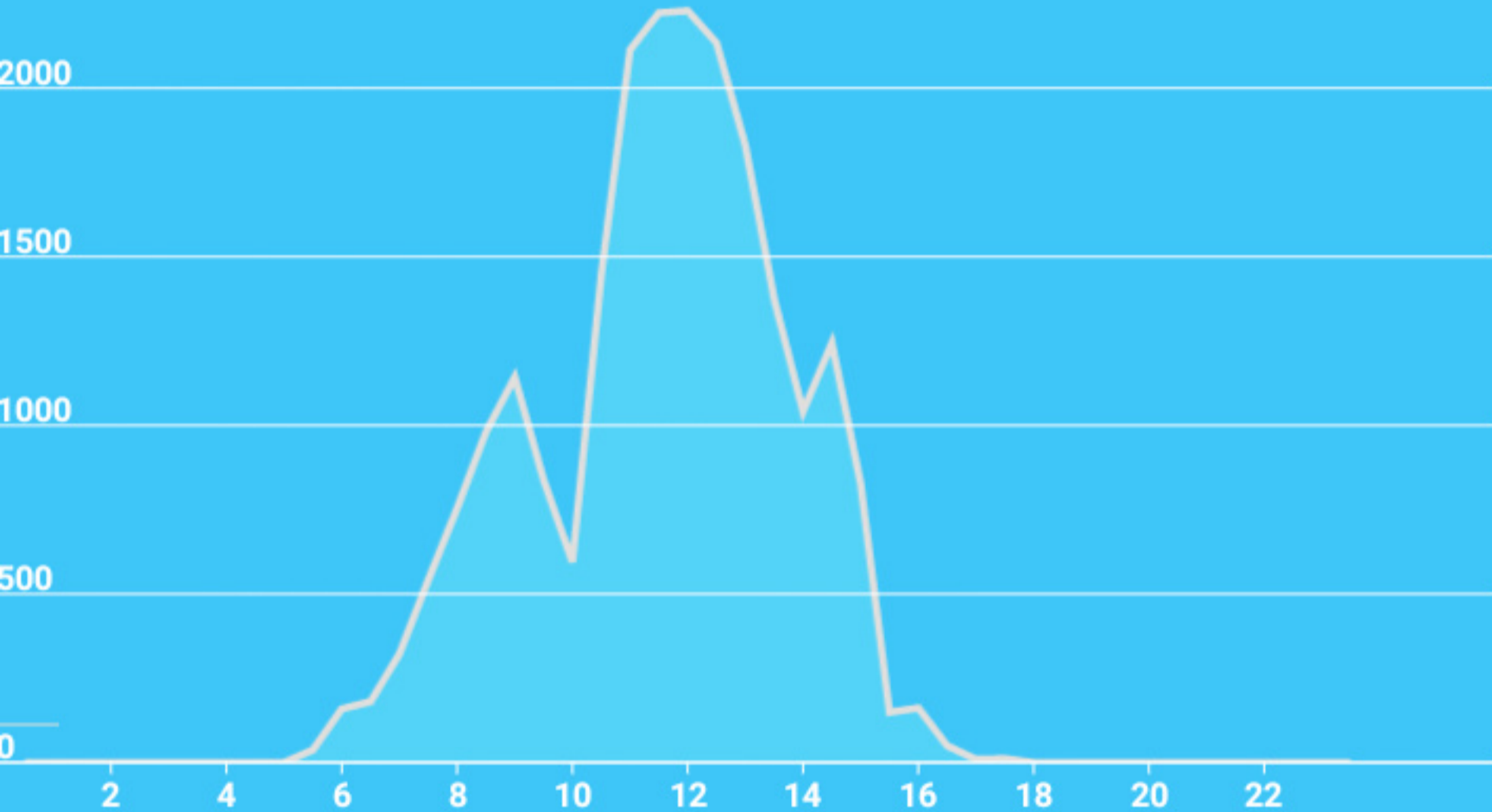
MONTH

YEAR

TOTAL

◀ 2017-05-08 ▶

Wh



Energy yield

12.4 kWh

Max value

2228.98Wh

Average value

518.14Wh



Solar energy

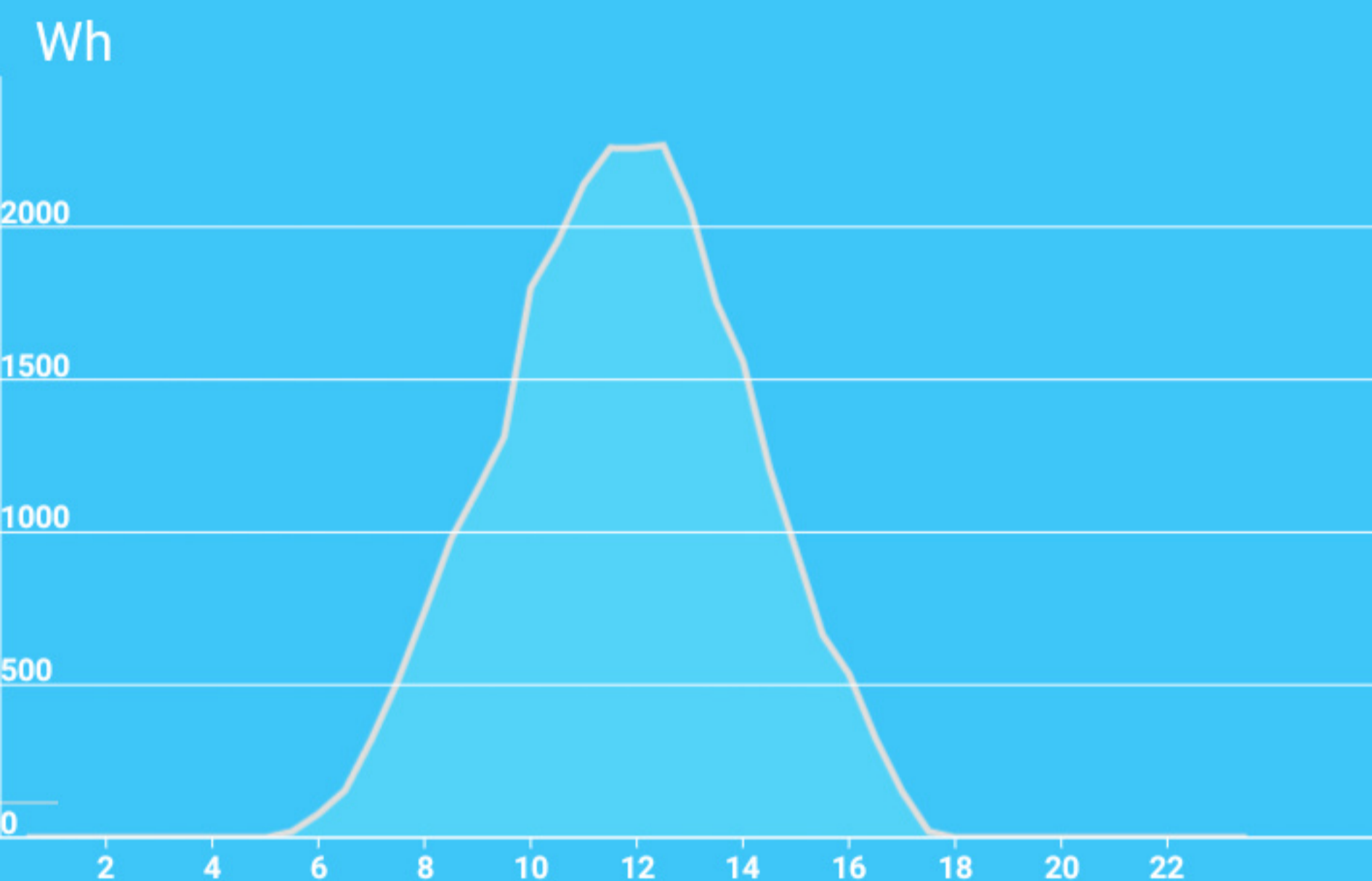
DAY

MONTH

YEAR

TOTAL

◀ 2017-05-07 ▶



Energy yield

13.6 kWh

Max value

2267.65Wh

Average value

566.03Wh



Solar energy

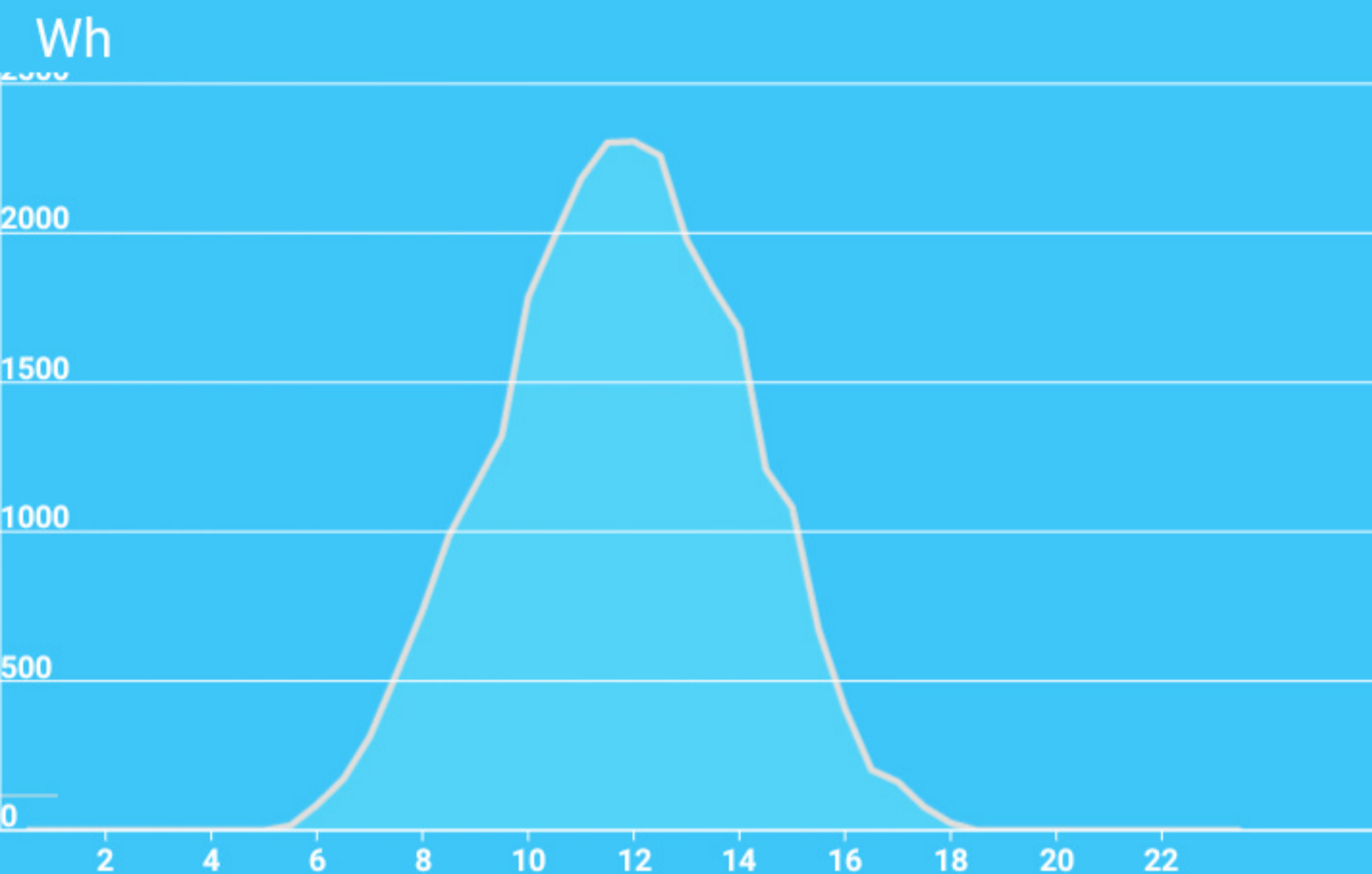
DAY

MONTH

YEAR

TOTAL

◀ 2017-05-04 ▶



Energy yield

13.7 kWh

Max value

2307.22Wh

Average value

571.69Wh



Solar energy

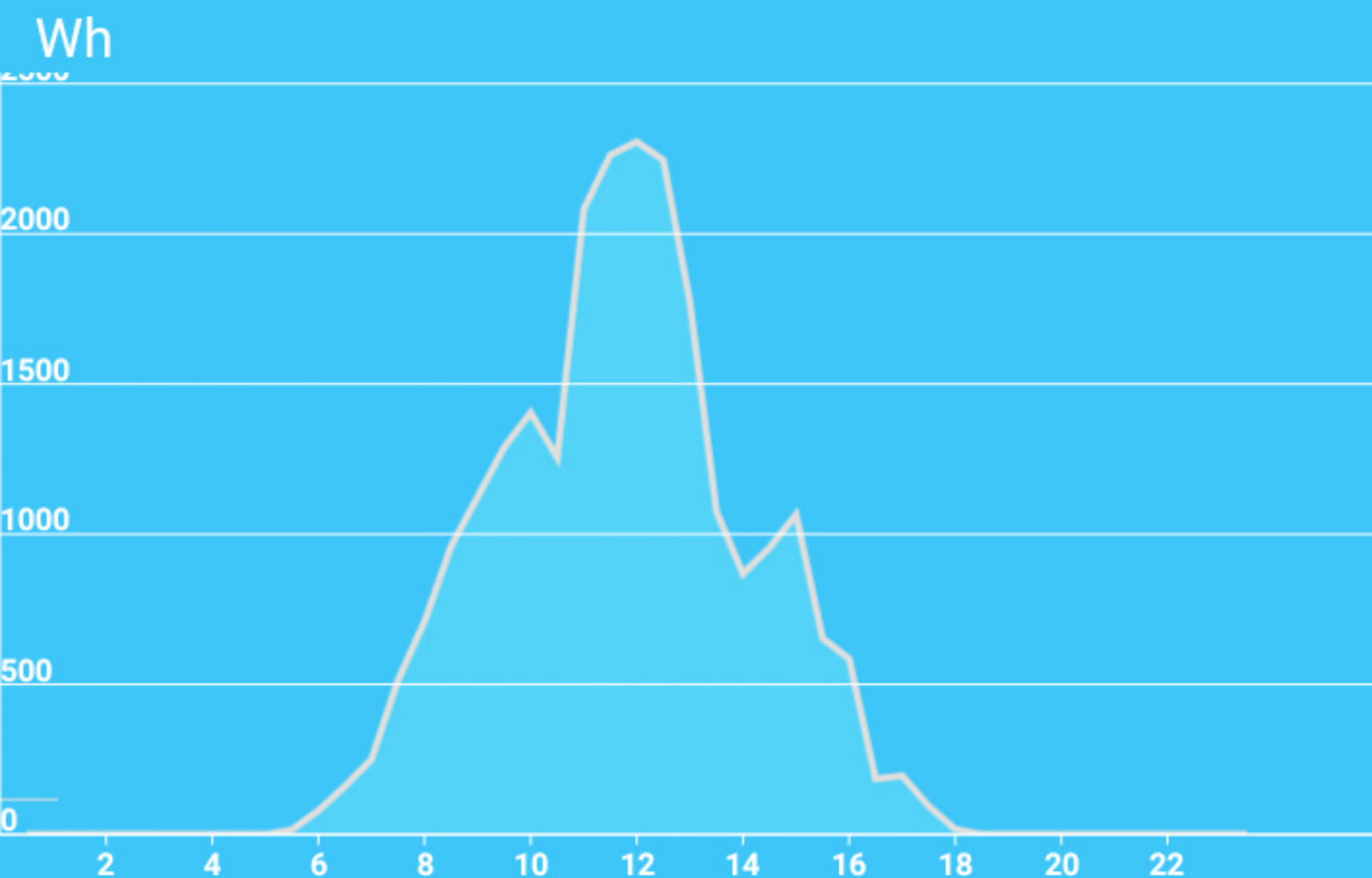
DAY

MONTH

YEAR

TOTAL

◀ 2017-05-03 ▶



Energy yield

12 kWh

Max value

2306.95Wh

Average value

502.73Wh



Solar energy

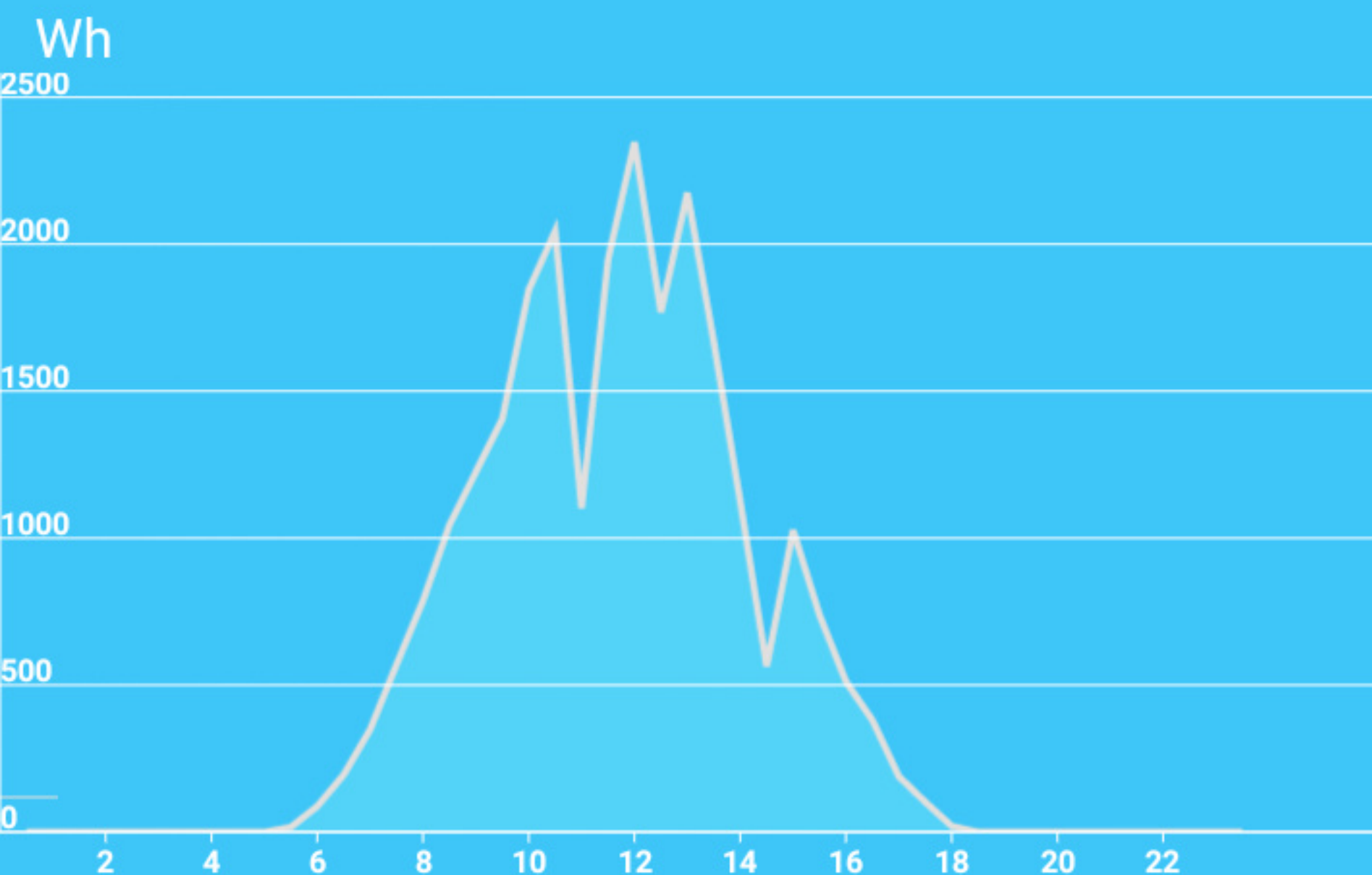
DAY

MONTH

YEAR

TOTAL

◀ 2017-05-01 ▶



Energy yield

12.6 kWh

Max value

2348.23Wh

Average value

526.05Wh



Solar energy

DAY

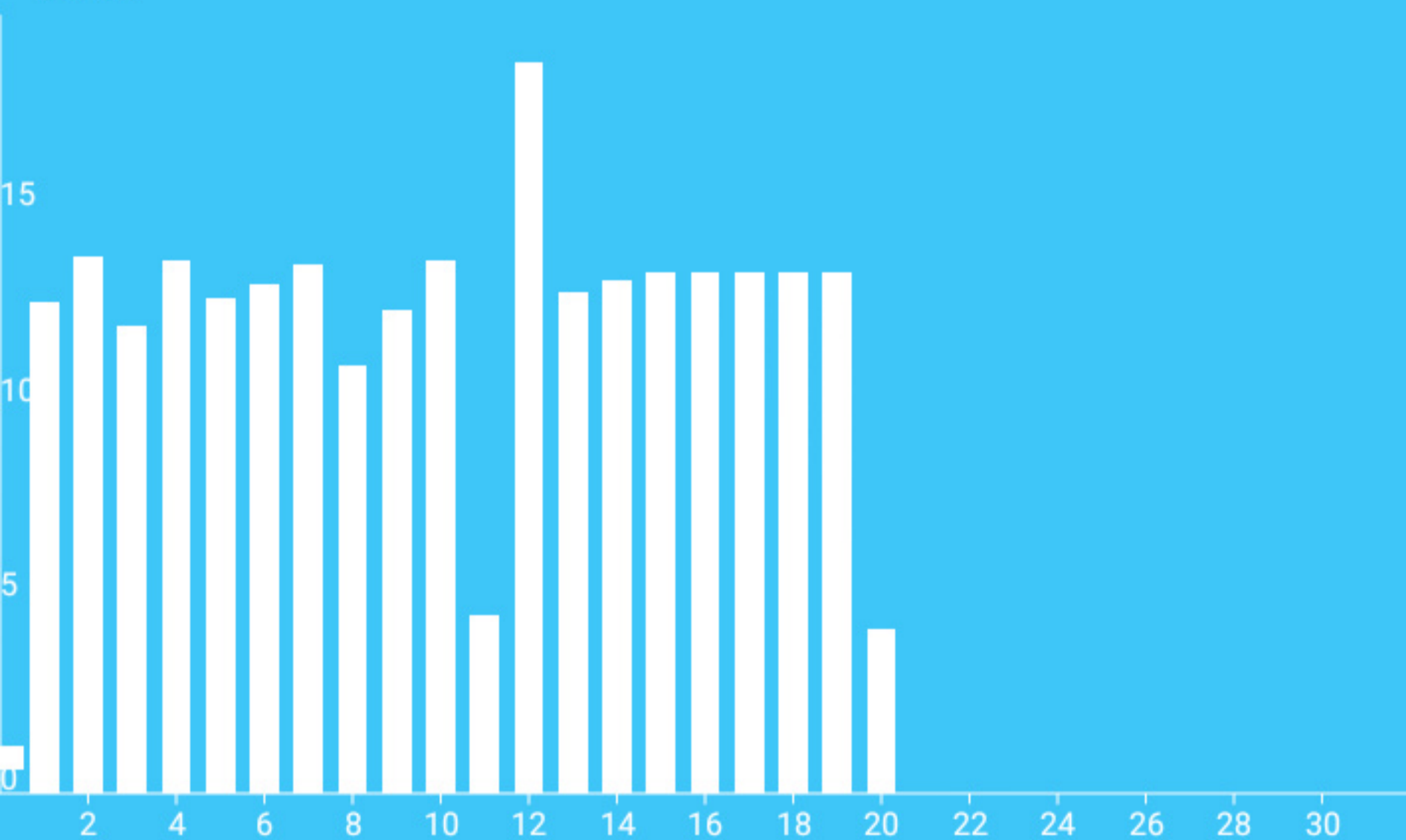
MONTH

YEAR

TOTAL

◀ 2017-05 ▶

kWh



Energy yield

249.3 kWh

Max value

18.8kWh

Average value

8.31kWh



Solar energy

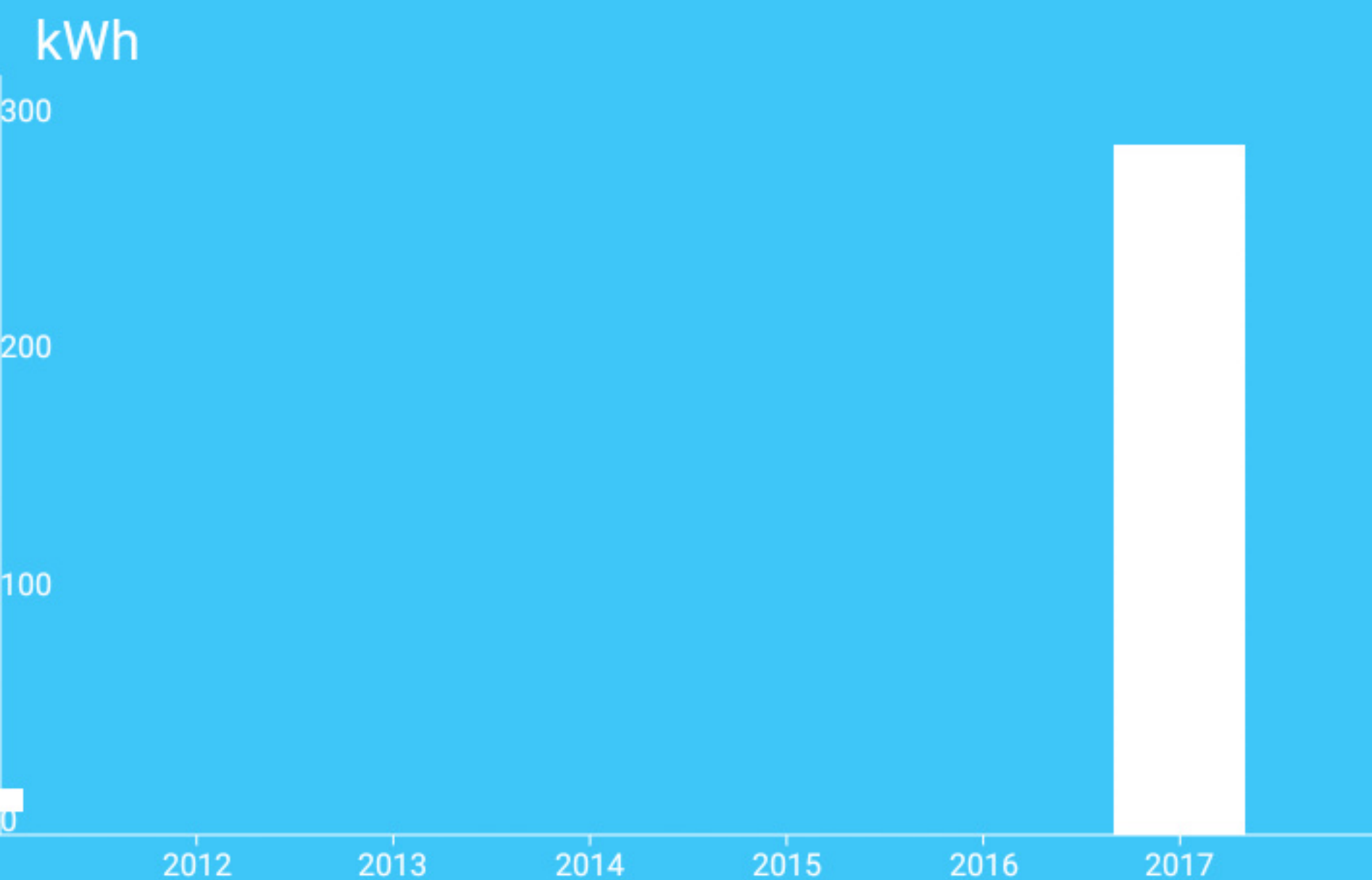
DAY

MONTH

YEAR

TOTAL

◀ TOTAL ▶



Energy yield

291.6 kWh

Max value

291.6kWh

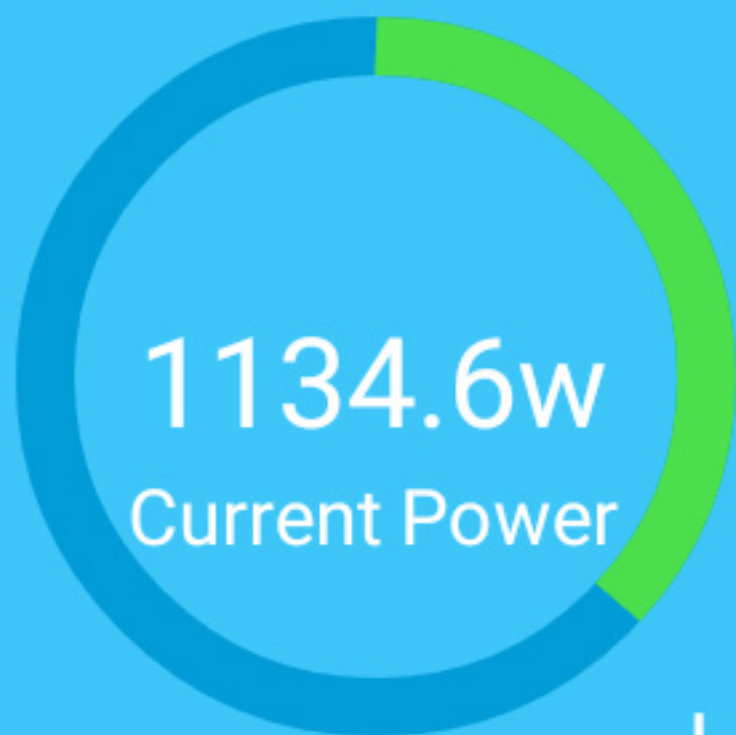
Average value

48.60kWh



90Z1650047

12.7kWh
Energy today



339.9kWh
Lifetime energy

Daily power chart(W)



Control



Parameter



Data



Events



Solar energy

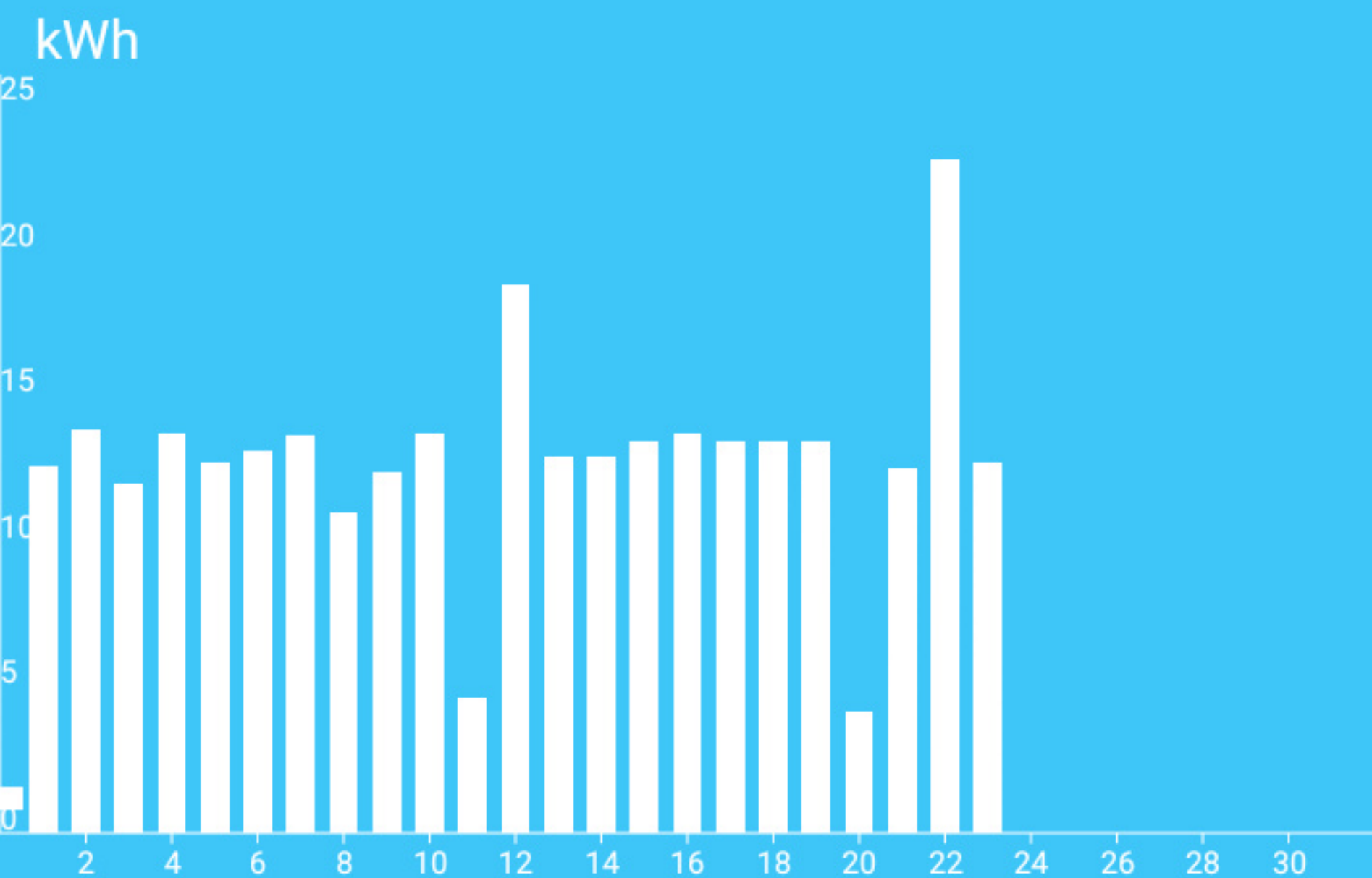
DAY

MONTH

YEAR

TOTAL

◀ 2017-05 ▶



Energy yield

297.6 kWh

Max value

23.1 kWh

Average value

9.92 kWh



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