Confidential

Global Off-Grid Power Station Equipment

Independent Industry Report

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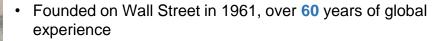


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Introduction of the Research

Global Off-Grid Power Station Equipment

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Report Summary

Research products	 Global off-grid Power Station Equipment According to the application scenarios of off-grid power station devices, the off-grid power station devices concerned in this survey are mainly divided into two categories:: Portable power station and Home power station. Portable power station is a small power station device that is safe, portable, stable and environmental friendly. It is also called "outdoor power supply". To ensure sufficient power generation and energy efficiency, portable power station is often used with solar panels, which can be called solar generator. Home power station has evolved from the initial diesel generator emergency power solution to a self-generated, self-stored power station system also with solar panels. The battery capacity of portable power station products is usually between 500Wh and 3000Wh, and the power of the supporting solar panels is between 40W and 200W. The battery capacity of household power station products is usually in the range of 3000Wh-6000Wh, and the power of the matching solar panels is between 200-500W.
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Geographical scope:

Global

Product Scope:

Compare the specifications of off-grid energy storage and solar panels of major global participants and the best sellers of products in Amazon and Alibaba, with comparison dimensions including product name, capacity, power, weight, dimensions, weight per watt-hour, volume per watt-hour, weight per watt and volume per watt.

Research

Scope

Report Description

Research Methodology	comprehensive First-hand manufacture Desk resea	pted a combination e and objective as <u>research:</u> Combiners around the wor	s possible.: ned with Frost&Sulliva ld; s comes from public ir	r ch and secondary rese an database and externa nformation such as corpo	I expert interviews,	covering mainstream of	ff-grid power station
Main research contents and Sample products	generators dimensions ➤ Gather and	focuses on the cor from various brand , specifically regard verify product para verify the develop	s and manufacturers ding their battery capa ameter information thr	grid solar generators - po available on the market. acity and power output. rough various channels to station through various of Goal Zero	The goal is to identi o assess characteris	fy products that excel in	n terms of weight and
Note: Sample products	only showcase a selec	ction of exhibits.	F 1				Source: Frost & Sullivan



Introduction of the Research

2 Global Off-Grid Power Station Equipment

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The application scenarios of off-grid power station equipment are divided into: portable powerable station and home power station

Off-grid power station equipment is divided into the following categories according to application scenarios:

Portable power station

- Due to the restrictions on large-scale gatherings caused by the epidemic, the public is increasingly inclined to choose low-density outdoor activities as leisure options. With the increasing popularity of outdoor lifestyles, the demand for outdoor power supply is showing an upward trend.
- In addition, frequent natural disasters pose challenges to the stability of power supply, thereby making emergency power equipment a necessary backup for households.
- Portable power station devices have become the preferred power solution for consumers on short trips due to their compact size, light weight and ease of portability.

Home power station

- Home power station devices are usually divided into two categories: Small power station equipment and large power station equipment. The power of small power station equipment is mostly between 3-6kwh, while large power station equipment is greater than 6kwh and is mostly fixed and cannot be transported.
- Small household power station devices can be used for outdoor activities, emergency power backup, and daily household electricity consumption of a certain amount of electricity, and have the attributes of consumer products.





Note: This survey focuses on small household power station devices in off-grid power station, which will be collectively referred to as home power station devices.



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Portable power station refers to a small device with a built-in lithium-ion battery, often referred to as an "outdoor power source", the device is favored for its lightweight, and easy portability, which is commonly used alongside a photovoltaic panel to enhance charging efficiency

Classification by Battery capacity	Product application scenarios	Product Examples
Portable power station with a capacity of less than 500Wh	 Entry-level outdoor travel model, suitable for suburban picnics, outdoor entertainment needs, etc., mainly for powering small-power electrical equipment such as TVs, small refrigerators, electric fans, etc. Taking the 300Wh product as an example, it can support 16 charging of mobile phones, 3 charging of laptops, 5+ hours of car refrigerators, and 3+ hours of TV operation. Smaller capacity and lower average price. Small weight, light volume, easy to carry. 	
Portable power station with a capacity of 500- 1000Wh	 The model is suitable for outdoor travel needs, such as camping, cycling, fishing, sports, outdoor entertainment, etc. It is mainly used for outdoor and home emergency electricity. Taking the 600Wh product as an example, it can support a small refrigerator to work for 6 hours, a 330W rice cooker to charge for 1.5+ hours, a laptop to charge 7 times, and a camera to charge 30+ times. Moderate amount of electricity, moderate average unit price. Small weight, light volume, easy to carry. 	
Portable power station with a capacity of <3000Wh	 Long-distance travel demand model, suitable for outdoor activities such as long-distance self-driving, mainly used for outdoor long-distance activities and home emergency electricity, can power more than 95% of household appliances Taking the 1200Wh product as an example, it can support a projector to work for 9 hours, a TV to work for 15 hours, and a 50W car refrigerator to work for 25 hours. Large charge, high average unit price. Moderate weight, moderate volume. 	

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Home power station refers to a small household powerable station device with a capacity of 3-6 kWh, equipped with solar panels to achieve self-generation, self-storage and self-use power station system

- A home power station system refers to the storage of electrical energy converted from renewable energy sources such as solar energy and wind energy in power station device inside the home for use by the family when needed.
- □ Home power station usually refers to small household powerable station devices with a capacity of 3-6 kWh, the concept originated from the early use of diesel generators to solve household emergency electricity needs. With the development of technology and changes in energy demand, home power station has evolved into a more advanced and environmentally friendly system.

Classification by Battery capacity	Product application scenarios	Product Examples
Power station with a capacity of 3000Wh	 An alternative to generators, it provides sufficient power for homes and outdoor activities, and is suitable for long-distance outdoor activities and emergency rescue applications, making it an ideal choice for a variety of power demand scenarios. It can power a 110W TV for 25 hours, a 120W refrigerator for 24 hours, charge a mobile phone more than 100 times, and a 900W electric oven for more than 2 hours. Large charge, high average unit price. Heavy weight, large volume. 	
Power station with a capacity of more than 5000wh-6000Wh	 Small household power station equipment, suitable for RV travel, long-distance outdoor travel, household power backup, emergency power supply and other application scenarios Taking a 5000Wh product as an example, it can power a 520W refrigerator for 10 hours, a 100W projector for 25 hours, a 900W air conditioner for 4.5 hours, and a 1400 water pump for 3.5 hours. Large amount of electricity, high average unit price. Heavy weight, large volume. 	

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Solar panels are utilized alongside power station to achieve real-time charging and discharging functions, the combination can be referred as "solar generators", the power of output of solar panels varies from 40w to 500w, the system is optimized according to different application scenarios and requirements

By power	Product Performance	Features
40W-100W solar panel	Commonly used with low-capacity portable power stations <u>below</u> <u>500Wh</u> . A 300Wh power station can be fully charged in approximately 9.5 hours.	 Lowest price Light in weight, compact in size when folded, easy to carry
100W solar panel	Commonly used with low-capacity portable power stations <u>below</u> <u>1000Wh.</u> A 500Wh power station can be fully charged in approximately 9.5 hours.	 Relatively low price Light in weight compact in size when folded, easy to carry
200W solar panel	Commonly used_with <u>1000-3000Wh</u> high-capacity portable power station or smaller power station. A 2000Wh power station can be fully charged in about 3.5 hours.	 Medium price Moderate weight, medium volume after folding, easy to carry
400W solar panel	Commonly used with high-capacity portable power station or small power station <u>above 3000Wh</u> . A 5000Wh power station can be fully charged in about 17 hours.	 High price Large volume, easy to carry after folding
500W solar panel	Commonly used with high-capacity portable power station or small power station <u>between 3000-5000Wh</u> . Using two 500W solar panels, a 2000Wh powerable station can be fully charged in about	 Higher price Large volume, can be disassembled and folded for use

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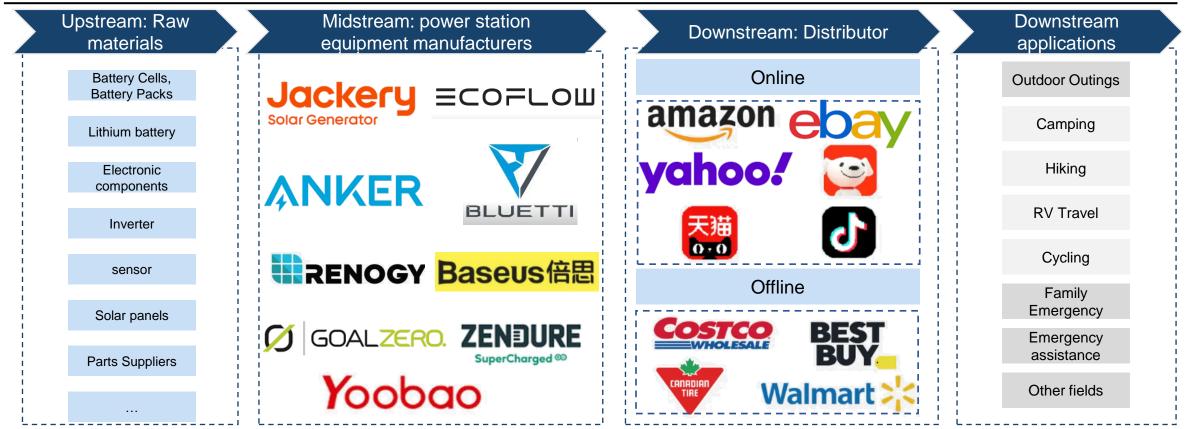
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The off-grid power station industry chain includes upstream raw materials, midstream power station equipment manufacturers, downstream distributors and application scenarios

The off-grid power station industry chain can be divided into three parts:

- The upstream is component manufacturers, which mainly include raw materials such as battery cells, inverters, electronic components, packaging materials and solar panels;
- The midstream consists of product manufacturers, such as those who design and produce portable power station systems. Some leading manufacturers have achieved independent technology, and many small companies in the industry mainly produce and process export products under OEM.
- The downstream involves distributor and application scenarios, with online presence in cross-border e-commerce and social media platforms, and offline presence in large supermarkets and stores.

Analysis of the off-grid power station industry chain



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With the development of the outdoor economy, consumers are increasingly for portable power station during their outdoor activities, while small household power station have gradually become a new growth point in the market due to their practicality and flexibility



Market Demand Growth

- ✓ With the rise of outdoor activities, consumers' demand for portable power station has surged. For example, in the camping market, various integrated business formats such as "camping + music" and "camping + market" have emerged.
- ✓ At the same time, with the frequent occurrence of natural disasters and increasing instability of power grids around the world, the demand for emergency power backup of portable power station products in homes and commercial places is also growing.



Concentrated Competition Landscape

- ✓ In the global off-grid power station power, Chinese manufacturers occupy a large market share. China's leading companies include Ecoflow, Jackery, Anker, Bluetti, etc., while Goal Zero is a foreign company.
- ✓ Portable power station products are consumeroriented (ToC) in nature, and early-mover companies have established a distinct competitive advantage in brand building and channel expansion.
- ✓ As the demand for high-power power station solutions grows, many companies are actively expanding their product lines, entering the home appliance power station market, and launching a diversified product portfolio to meet market demand.

Small household power station devices become a new growth point

- ✓ Application scenario expansion: With the continuous rise in energy and electricity prices, home power station equipment has been rapidly promoted abroad. Especially in Europe, North America and other regions, due to the sharp rise in energy and electricity prices, the application of home photovoltaic + power station systems can improve the level of electricity selfsufficiency, slow down and reduce the risks brought by rising electricity prices.
- Technological progress and cost reduction: Technological advances have significantly improved the performance and life of home power station, while also expanding its application scenarios and functions. Cost reductions have made home power station equipment more affordable, improving its return on investment and competitiveness.

Market participants in the off-grid power station start with small-capacity portable power station, as market demand continues to evolve, they gradually expand their product lines to launch higher-power home power station, and solar generators (1/2)

Comparison of major players in off-grid power station Name of main Year of Production **Brand Type Company Introduction** participants **Establishment** Capabilities The company has created new categories of portable power station and Jackery home power station, and launched solar generators. In the early days, the olar Generato Portable power station Independent production, company focused on outdoor portable power station and successfully launched 2011 a small amount of a variety of power station with different specifications and capacities to meet the Home power station Jackery diverse outdoor power needs. At this stage, the product line has been further Solar generators outsourcina expanded to launch large-capacity home power station to adapt the development trend and market demand of home electricity. The company focuses on innovative R&D and sales in the field of mobile power ECOFLOW station and clean energy, with products including the River series and Delta series of power station power supplies. The River series meet the needs of Portable power station 2017 Home power station Independent production small devices with its light weight, portability and moderate capacity, while the Solar generators Delta series has a slightly larger capacity and provides solutions for larger-scale Ecoflow energy supply. In addition, the company provides products such as solar panels and solar generators to provide more efficient power station package. The company's Bluetti brand was established in 2019 and is positioned in the field of portable power station. In 2020, Bluetti brand products extended from Independent production, portable to household solar power station and commercial photovoltaic Portable power station a small amount of power station. The company's various product lines and other modules are 2013 Home power station BLUETT self-developed and self-produced, providing a variety of capacity options and outsourcing Solar generators Bluetti abundant product series, also a combination of solar generators. Among them, for power station exceeding the capacity of 3kWh, the inverter and battery are usually separated.

Note: The companies are ranked in no particular order, and the main enterprise in the market are selected for analysis

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Market participants in the off-grid power station start with small-capacity portable power station, as market demand continues to evolve, they gradually expand their product lines to launch higher-power home power station, and solar generators (2/2)

Comparison of major players in off-grid power station

Name of main participants	Year of Establishment	Brand Type	Production Capabilities	Company Introduction
GOALZERO. Goal Zero	2009 Founded in the United States	Portable power station Home power station Solar generators	OEM	The company is an American off-grid and portable solar equipment company. Its product line covers a wide range of application scenarios, from 200Wh portable power station to 8000Wh home powerable station devices. The company cooperates with many Chinese companies, and its main products are produced with OEM.
Anker	2011	Portable power station Home power station (Home power stations are relatively rare) Solar generators	Independent production	The company focuses on the research and development, design and sales of consumer electronic products, with a complete brand matrix covering multiple categories, including charging, wireless audio and smart home. The company has few choices of portable power station and home power station, and its main business is mobile power supplies.
RENOGY Renogy	2011 Founded in the United States	Portable power station Home power station (Power stations are relatively few) Solar generators	Independent production	The company is a solar energy product and service provider, focusing on providing solar energy components and accessories, such as solar photovoltaic panels, charging controllers, integrated inverters and other key components. There are fewer power stations equipment.
ZENDURE SuperCharged © Zendure	2017 Dual headquarters in Guangzhou and Silicon Valley	Portable power station Home power station (Home power station are relatively few) solar generators	Independent production	The company is committed to home energy solutions, providing users with plug-and-play smart microgrid systems. The company provides small-capacity power station, with a small variety of products.

Note: The companies are ranked in no particular order, and the main enterprise in the market are selected for analysis.

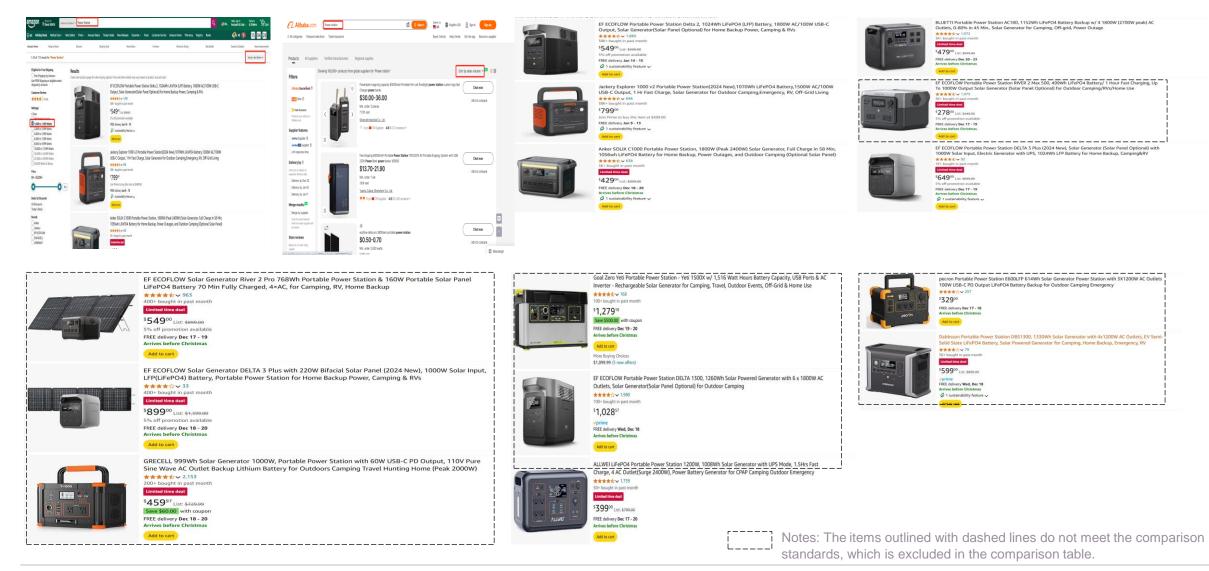
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Off-grid home power station is gradually becoming the development direction of the industry, where lightness and compactness are key considerations for consumers when making choices



- Goal: At present, household power station is gradually becoming the development direction of the industry. The design purpose of portable power station
 is to achieve small size, lightweight and easy to carry in outdoor activities. Similarly, whether off-grid household power station also has a light weight
 and small size equipment (includes power station + solar panels, solar generators).
- Method: Compare and analyze the performance of different manufacturers in power station and solar panels for1kWh, 2kWh, 3kWh and 5kWh capacities. Start by comparing the weight and volume of power station for 1kWh and 2kWh options. 3kWh and 5kWh are selected as the comparison basis because household power station usually starts from 3kWh, and most products are mainly concentrated around 3kWh or 5kWh. Power stations exceed 6kWh is considered as super-large household power station, which does not meet the requirements of lightness and compactness.
- Solar panel selection criteria: When comparing solar panels, most manufacturers tend to use 200W solar panels with power station, for example, 3 kWh with 200W. For 5 kWh power station equipment, it is usually matched with 500W solar panels. Enterprises can choose multiple solar panels with different powers station as needed to achieve the best effect.

By selecting products through Alibaba and Amazon's online platforms, filter a list of the best-selling power stations globally, excluding any 1kWh capacity with fluctuations beyond 10% and excluding items that are not categorized as power stations



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Comparing weight, volume, weight per watt-hour and volume per watt-hour, Jackery Explorer 1000 V2 is the smallest and lightest portable power station globally with a capacity of 1kWh*

Comparison of products with portable power station of about 1kWh

Product Name	Battery capacity (Wh)	Weight (Kg)	Dimensions (cm)	Volume(cm ³)	Cycle Life	Weight per watt-hour= Weight/Capacity(g/Wh)	Volume per watt-hour = Volume/Capacity (cm³/Wh)
Goal Zero Yeti 1000X	983Wh	14.4kg	38.7*26*25cm	25,155cm ³	500 times (Remains 80%+)	14.6g/Wh	25.6cm ³ /Wh
Grecell (Lithium Battery)	999Wh	8.1kg	29.5*20.1*20.1cm	11,918.3cm ³	-	8.1g/Wh	19.8cm ³ /Wh
Allwei 1200W LifePO4	1008Wh	13.2kg	37.8*21.8*25.9cm	21,342.6cm ³	3500 times (Remains 70%+)	13.1g/Wh	19.8cm ³ /Wh
Ecoflow Delta 2	1024Wh	12kg	40*21.1*28.1cm	23,716.4cm ³	3000 times (Remains 80%+)	11.7g/Wh	23.2cm ³ /Wh
Ecoflow Delta 3 Plus	1024Wh	12.5kg	40*21.1*28.1cm	23,716.4cm ³	4000 times (Remains 80%+)	12.2g/Wh	23.2cm ³ /Wh
Anker Solix C1000	1056Wh	12.9kg	37.6*20.5*26.7cm	20,580.4cm ³	3000 times (Remains 80%)	12.2g/Wh	19.5cm³/Wh
Jackery Explorer 1000 V2	1070Wh	10.8kg	32.7*22.4*24.7cm	18,092.3cm ³	4000 times (Remains 70%+)	10.1g/Wh	16.9cm³/Wh
Bluetti AC180	1152Wh	16kg	34*24.7*31.7cm	26,621.7cm ³	3500 times (Remains80%)	13.9g/Wh	23.1cm ³ /Wh

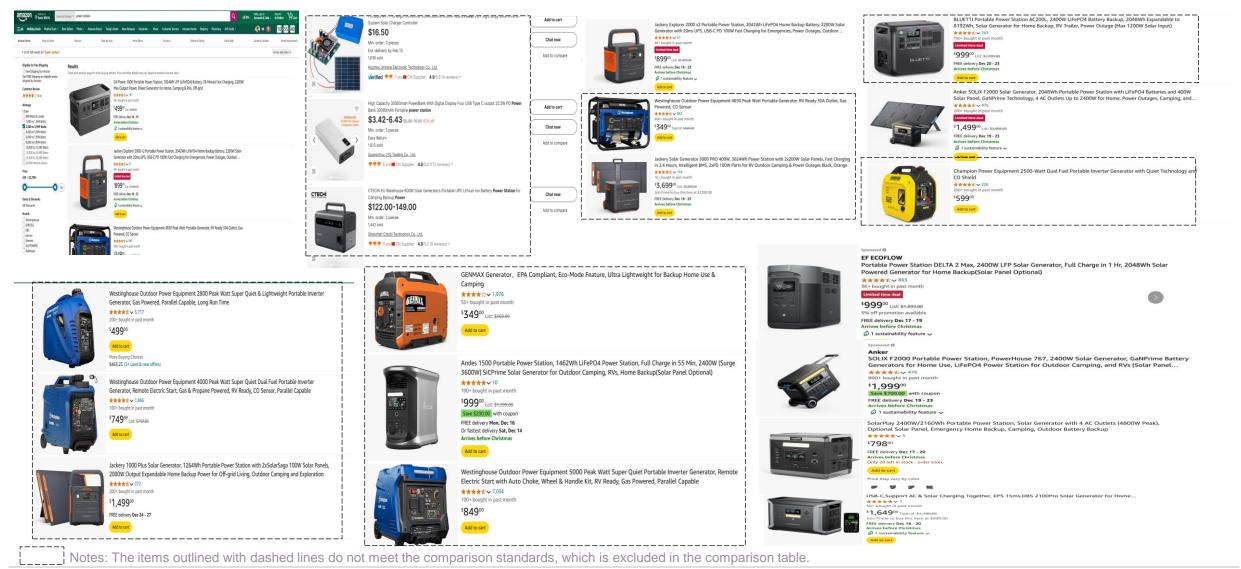
In portable power station, products from the online websites, including Amazon and Alibaba are selected for comparison among the best sellers, with a particular focus on a capacity of around 1 kWh, allowing for a 10% variation in capacity. Due to differences in capacity, the assessment includes weight per watt-hour and volume per watt-hour as criteria.

By comparing the products of the aforementioned companies, including weight, volume, weight per watt-hour and volume per watt-hour, and <u>the battery of Life PO4,Grecell utilizes</u> <u>lithium battery, no comparison is made</u>. Therefore, Jackery Explorer 1000 V2 emerges as the portable power station with the smallest volume and lightest weight globally.

* Note: By selecting the best-selling products for comparison, and the conclusions were drawn based on the products listed above. Except Grecell, the products areall LifePO4 Battery.



By selecting products through Alibaba and Amazon's online platforms, filter a list of the best-selling power stations globally in capacity of 2kWh, excluding any 2kWh capacity with fluctuations beyond 10% and excluding items that are not categorized as power stations





Comparing weight, volume, weight per watt-hour and volume per watt-hour, Jackery Explorer 2000 V2 is the smallest and lightest portable power station globally with a capacity of 2kWh*

Comparison of products with portable power station of about 2kWh

Product Name	Battery Capacity (Wh)	Weight (Kg)	Dimensions(cm)	Volume(cm ³)	Cycle Life	Weight per watt-hour = Weight/Capacity(g/Wh)	Volume per watt-hour = Volume/Capacity (cm³/Wh)
Bluetti AC200L	2048Wh	27.9kg	41.9*27.9*36.6cm	42,785.8cm ³	3000 times (Remains 80%)	13.6g/Wh	20.9cm ³ /Wh
Jackery Explorer 2000 V2	2042Wh	17.9kg	29.2*26.4*33.5cm	25,824.5cm ³	4000 times (Remains 70%)	8.8g/Wh	12.6cm³/Wh
Ecoflow Delta 2 Max	2048Wh	23kg	49.7*24.2*30.5cm	36,683.6cm ³	3000 times (Remains 80%)	11.2g/Wh	17.9cm³/Wh
Anker Solix F2000	2048Wh	30.5kg	52.5*39.5*25cm	51,843.8cm ³	3000 times (Remains 80%)	14.9g/Wh	25.3cm ³ /Wh
DBS2100 Pro	2150Wh	24.5kg	43.2*25.4*30.2cm	33,137.9cm ³	4500 times (Remains 80%)	11.4g/Wh	15.4cm ³ /Wh
SolarPlay Q2501	2160Wh	21.5kg	39.1*28.5*31.9cm	35,547.8cm ³	3500 times	9.9g/Wh	16.5cm³/Wh

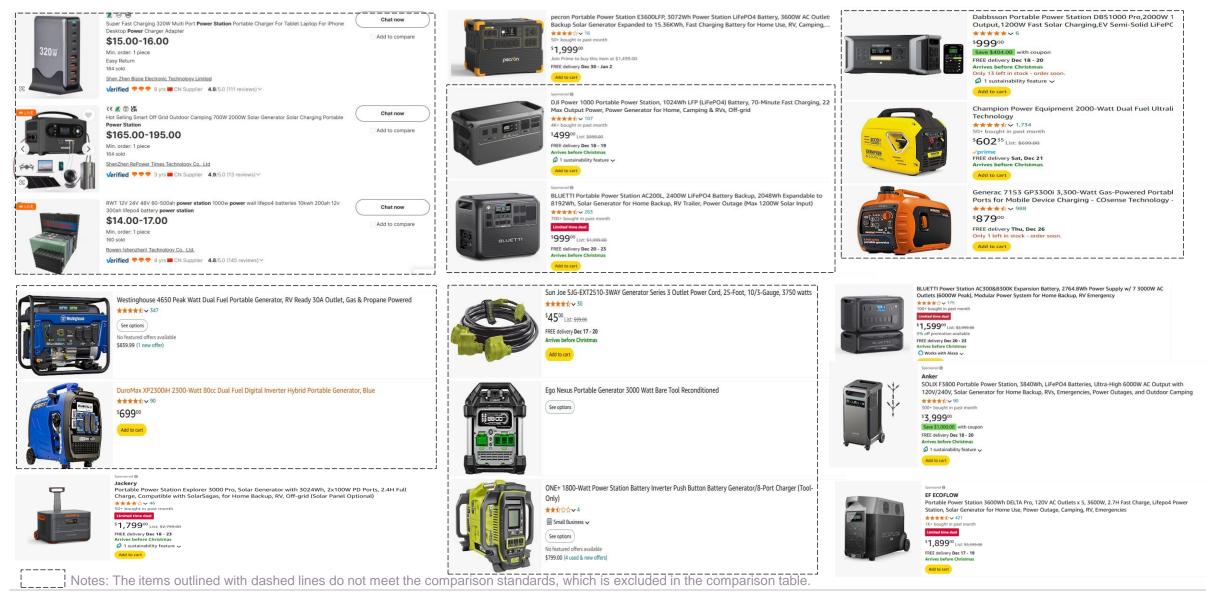
In portable power station, products from the online websites, including Amazon and Alibaba are selected for comparison among the best sellers, with a particular focus on products having a battery capacity of around 2 kWh, allowing for a 10% variation in capacity. The assessment includes weight per watt-hour and volume per watt-hour as evaluation criteria.

By comparing the products of the aforementioned companies, including weight, volume, weight per watt-hour, and volume per watt-hour, the Jackery Explorer 2000 V2 is identified as the power station with the smallest volume and lightest weight globally in capacity of 2kWh.

* Note: By selecting the best-selling products for comparison, and the conclusions were drawn based on the products listed above.



Selecting products through Alibaba and Amazon's online platforms, filter a list of the best-selling power stations globally in capacity of 3kwh, excluding items that are not categorized as power stations



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Comparing weight, volume, weight per watt-hour and volume per watt-hour, Jackery Explorer 3000 V2 is the smallest and lightest in the 3kWh off-grid household power station globally*

Comparison of products with off-grid household power station of about 3 kWh

Product Name	Battery capacity (Wh)	Weight(Kg)	Dimensions (cm)	Volume(cm³)	Cycle Life	Weight per watt-hour = Weight/Capacity(g/Wh)	Volume per watt-hour = Volume/Capacity (cm³/Wh)
Bluetti AC300+B300K	2764.8Wh	Inverter AC300: 21.6kg Battery B300K: 29.5kg 51kg	Inverter AC300: 52*32*35.8cm Battery B300K: 52.5*32.7*20.9cm	95,451.3cm ³	4000 times(Remains 80%)	18.4g/Wh	34.5cm ³ /Wh
Jackery Explorer 3000 Pro	3024Wh	29kg	47.2*37.3*35.8cm	63,028cm ³	2000 times (Remains 70%)	9.6g/Wh	20.8cm ³ /Wh
Jackery Explorer 3000 V2	3072Wh	27kg	41.6*32.5*30.5cm	41,236cm ³	4000 times (Remains 70%)	8.8g/Wh	13.4cm³/Wh
Percon E3600LFP	3072Wh	35.8kg	44.5*30.7*35.1cm	47,951.9cm ³	3500 times (Remains 80%)		15.6cm³/Wh
Ecoflow Delta 3000	3200Wh	45kg	63.5*28.5*41.6cm	75,285.6cm ³	3000 times	14.1g/Wh	23.5cm ³ /Wh
Ecoflow Delta Pro	3600Wh	45kg	63.5*28.4*42cm	75,742.8cm ³	3500 times (Remains 80%)	12.5g/Wh	21cm³/Wh
Anker Solix F3800	3840Wh	60kg	70.2*38.3*37cm	100,779.1cm ³	3000 times (Remains 70%)	15.6g/Wh	26.2cm ³ /Wh

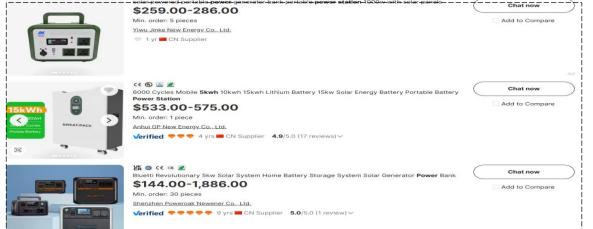
In the off-grid power station, products from the online website, including Amazon and Alibaba are selected for comparison among the best sellers, with special attention to household power station with a battery capacity around 3 kWh. Since the capacity of 3 kWh produced by different companies varies to a certain extent, such as between 600-800W. Considering that the product capacity of Ecoflow and Anker is relatively large, the weight per watt-hour and volume per watt-hour are added as evaluation criteria.

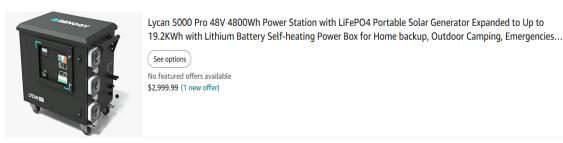
By comparing the products of the aforementioned companies, taking into account weight, volume, weight per watt-hour and volume per watt-hour, Jackery Explorer 3000 V2 is the smallest and lightest household power station globally in capacity of 3kWh.

Note: 1) By selecting the best-selling products for comparison, and the conclusions were drawn based on the products listed above; 2) Different countries have varying names for Jackery 3000V2, America and Canada: 3000V2, Japan: 3000NEW, China: 3000Pro2.



By selecting products through Alibaba and Amazon's online platforms, filter a list of the best-selling power stations globally in capacity of 5kwh, excluding any 5kWh capacity with fluctuations beyond 10% and excluding items that are not categorized as power stations





Jackery

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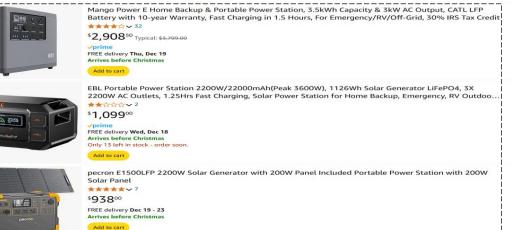


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Source: Official website. Frost & Sullivan

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Comparing weight, volume, weight per watt-hour and volume per watt-hour, Jackery Explorer 5000 Plus is the smallest and lightest in the 5 kWh off-grid household power station globally*

Comparison of products with off-grid household power station of about 5 kWh

Product Name	Battery capacity (Wh)	Weight(Kg)	Dimensions (cm)	Volume (cm ³)	Cycle Life	Weight per watt-hour = Weight/Capacity(g/Wh)	Volume per watt-hour = Volume/Capacity (cm³/Wh)
Renogy Lycan 5000 Power Box	4800Wh	122kg	50.8*72.4*83.6cm	307,474.1cm ³	4500 times (Remains 80%)	25.4g/wh	64.1cm³/Wh
Jackery Explorer 5000 Plus	5040Wh	61kg	63.5*39.5*41.8cm	104,844.9cm ³	4000 times (Remains 70%)	12.1g/wh	20.8cm³/Wh
Bluetti EP500	5120Wh	75.8kg	57.9*30*76cm	132,012cm ³	3500 times (Remains 80%)	14.8g/wh	25.8cm³/Wh
Bluetti EP500 Pro	5120Wh	83kg	57.9*30*76cm	132,012cm ³	3500times (Remains 80%)	16.2g/wh	25.8cm³/Wh
Bluetti AC500+2*B300K	5529.6Wh	Inverter AC500: 30kg Battery B300K: 29.5kg 89kg	Inverter AC500: 52*32.5*35.8cm Battery B300K: 52.5*32.7*20.9cm	132,262.2cm³	4000 times (Remains 80%)	16.1g/wh	23.9cm³/Wh

In the off-grid power station, the products of major players are selected for comparison, with special attention to household power station products with a battery capacity around 5 kWh. Since the capacity of 5 kWh products produced by different companies varies to a certain extent, a reasonable capacity floating range is selected for comparison. Considering the difference in capacity, the weight per watt-hour and volume per watt-hour are added as evaluation criteria.

By comparing the products of the aforementioned companies, taking into account weight, volume, weight per watt-hour and volume per watt-hour, Jackery Explorer 5000 Plus is the world's smallest and lightest household power station in capacity of 5kWh.

* Note: By selecting the best-selling products for comparison, and the conclusions were drawn based on the products listed above.



Comparing key performance indicators, including weight, volume and weight per watt, Jackery SolarSaga 200W is the lightest weight and smallest volume in 200W solar panels globally*

200W Solar Panels Comparison

Product Name	Power (W)	Weight(Kg)	Folded dimensions(cm)	Volume(cm³)	Unfolded dimensions (cm)	Weight per watt = Weight/Power (g/W)
Jackery SolarSaga 200W	200W	6.2kg±0.3 kg	61.5*55.2*4cm	13,579.2cm ³	234*55.2*2.5cm	31g/W
Goal Zero Nomad 200	200W	10kg	71.6*56.6*5cm	20,262.8cm ³	71.6*255.8*2.5cm	50g/W
Bluetti SP200L	200W	7.8kg	57.3*60.1*7.5cm	25,827.9cm ³	60.1*20.96cm	39g/W
Percon PV200	200W	7.7kg	59.7*61**4.2cm	15,295.1cm ³	222*61*2.7cm	38.5g/W
Bluetti PV200D	200W	8.1kg	58.5*60.8*4.5cm	16,005.6cm ³	60.8*21.05cm	36.5g/W
Anker 531	200W	7.4kg	57.0*60.2*6.0cm	20,588.4cm ³	60.2*213*2.0cm	46g/W
Anker Solix PS200	200W	9.2kg	55.6*60.7*5.1cm	17,212.1cm ³	208*59.4*2.8	37g/W

The coordinated use of solar panels and power station can significantly improve the continuous supply capacity of the equipment. For a 200W solar panel, it is suitable to be matched with a 1000-3000Wh power station to achieve the best energy management effect.

After comparing the 200W solar panels from several selected well-known companies on the market, especially in terms of weight, volume and weight per watt, Jackery SolarSaga 200W is the lightest weight and smallest volume in 200W solar panels globally among selected company products

* Note: The selection of the aforementioned products is integrated with the previous comparative of power station companies, and the conclusions were drawn based on the products listed above.



Comparing key performance indicators, including weight, volume, weight per watt and volume per watt, Jackery SolarSaga 500W is the lightest weight and smallest volume in 500W solar panels globally*

400-500W Solar Panels Comparison

Product Name	Power (W)	Weight(Kg)	Folded dimensions (cm)	Volume(cm ³)	Unfolded dimensions(cm)	Weight per watt = Weight/Power (g/W)	Volume per watt = volume/Power (cm ³ /W)
Renogy 400W	400W	13.7kg	85.6*70.9*8.1cm	49159.2cm ³	283.8*85.5*2cm	34.3g/W	122.9cm³/W
Ecoflow 400W Rigid	400W	21.8kg	-	68,346.2cm ³	172.2*113.4*3.5cm	54.5g/W	170.9cm³/W
Jackery SolarSaga 500W	500W	10.5kg±0.5 kg	99.6*52.6*9.7cm	50,817.9cm ³	249.3*99.6*29.4cm	21g/W	101.6cm³/W
Ecoflow 500W, 4- piece kit (125Wx4 Bifacial)	500W	16.8kg	61.2*115.5*8.8cm	62,203.7cm ³	245*115.5*2.2cm	33.6g/W	124.4cm ³ /W

400-500W solar panels are usually paired with 3-5kWh power station. Currently, there are relatively few 500W solar panel products in the industry, 400W and 500W are both selected for comparison. Since the power is not on the same scale, the weight per watt and volume per watt are included as evaluation criteria.
 By comparing the products of the aforementioned companies, taking into account weight, weight per watt and volume per watt, Jackery SolarSaga 500W is the lightest weight and smallest volume in 500W solar panels globally among selected company products.

* Note: The selection of the aforementioned products is integrated with the previous comparative of power station companies, and the conclusions were drawn based on the products listed above.



Comparing key performance of solar generators, Jackery SG1000V2 (200W) is the smallest and lightest solar generator with capacity of 1kWh on a global scale*

Solar Generator	Product Name	Capacity(Wh) /Power(W)	Weight(kg)	Volume(cm ³)	Weight per watt-hour(g/Wh)/ Weight per watt (g/W)	Volume per watt-hour (cm³/Wh)/ Volume per Watt(cm³/W)
Goal Zero-Solar	Goal Zero Yeti 1000x	983Wh	14.4kg	25,155cm ³	14.6g/Wh	25.6cm ³ /Wh
Generator	Goal zero Nomad 200	200W	10kg	20,262.8cm ³	50g/W	101.3cm³/W
Jackery-Solar	Jackery Explorer 1000 V2	1070Wh	10.8kg	18,092.3cm ³	10.1g/Wh	
Generator SG1000V2	Jackery SolarSaga 200W	200W	6.2kg±0.3 kg	13,579.2cm ³	31g/W	67.9cm³/W
	Anker Solix C1000x	1056Wh	12.9kg	20,580.4cm ³	12.2g/Wh	19.5cm³/Wh
Anker-Solar Generator	Anker 531	200W	7.4kg	20,588.4cm ³	46g/W	102.9cm ³ /W
	Anker Solix PS200	200W	9.2kg	17,212.1cm ³	37g/W	86.1cm ³ /W
	Bluetti AC180	1152Wh	16kg	26,621.7cm ³	13.9g/Wh	23.1cm ³ /Wh
Bluetti-Solar Generator	Bluetti SP200L	200W	7.8kg	25,827.9cm ³	39g/W	129.1cm ³ /W
	Bluetti PV200D	200W	8.1kg	16,005.6cm ³	36.5g/W	80cm ³ /W

• Solar generators typically combines power station with solar panels, extended outdoor camping trip require continuous power to support power station, solar generators can significantly increase the energy storage capacity, thereby extending usage time and enhancing convenience.

For instance, a 1kWh power station paired with a 200W solar panel provides greater energy efficiency than traditional storage products. Among the previously selected list of companies, Jackery E1000 V2 and Jackery SolarSaga 200W leads globally with its lightweight design for both 1kWh power station and solar panels. Consequently, Jackery SG1000V2 is the smallest and lightest option available on a global scale.



Comparing key performance of solar generators, Jackery SG1000V2 (200W) is the smallest and lightest solar generator with capacity of 1kWh on a global scale*



- Solar generators typically combines power station with solar panels, extended outdoor camping trip require continuous power to support power station, solar generators can significantly increase the energy storage capacity, thereby extending usage time and enhancing convenience.
- For instance, a 1kWh power station paired with a 200W solar panel provides greater energy efficiency than traditional storage products. Among the previously selected list of companies, Jackery E1000 V2 and Jackery SolarSaga 200W leads globally with its lightweight design for both 1kWh power station and solar panels. Consequently, **Jackery SG1000V2** is the smallest and lightest option available on a global scale.



Comparing key performance of solar generators, Jackery SG2000V2 (200W) is the smallest and lightest solar generator with capacity of 2kWh on a global scale*

Solar Generator	Product Name	Capacity(Wh) /Power(W)	Weight(kg)	Volume(cm ³)	Weight per watt-hour(g/Wh)/ Weight per watt (g/W)	Volume per watt-hour (cm³/Wh)/ Volume per Watt(cm³/W)
	Bluetti AC200L	2048Wh	27.9kg	42,785.8cm ³	13.6g/Wh	20.9cm³/Wh
Bluetti-Solar Generator	Bluetti SP200L	200W	7.8kg	25,827.9cm ³	39g/W	129.1cm ³ /W
	Bluetti PV200D	200W	8.1kg	16,005.6cm ³	36.5g/W	80cm ³ /W
Jackery-Solar	Jackery Explorer 2000 V2	2042Wh	17.9kg	25,824.5cm ³	8.8g/Wh	12.6cm³/Wh
Generator SG2000V2	Jackery SolarSaga 200W	200W	6.2 kg ± 0.3 kg	13,579.2cm ³	31g/W	67.9cm³/W
	Anker Solix F2000x	2048Wh	30.5kg	51,843.8cm ³	14.9g/Wh	25.3cm³/Wh
Anker-Solar Generator	Anker 531	200W	7.4kg	20,588.4cm ³	46g/W	102.9cm³/W
	Anker Solix PS200	200W	9.2kg	17,212.1cm ³	37g/W	86.1cm ³ /W

• Solar generators typically combines power station with solar panels, extended outdoor camping trip require continuous power to support power station, solar generators can significantly increase the energy storage capacity, thereby extending usage time and enhancing convenience.

For instance, a 2kWh power station paired with a 200W solar panel provides greater energy efficiency than traditional storage products. Among the previously selected list of companies, Jackery E2000 V2 and Jackery SolarSaga 200W leads globally with its lightweight design for both 2kWh power station and solar panels. Consequently, Jackery SG2000V2 is the smallest and lightest option available on a global scale.



Comparing key performance of solar generators, Jackery SG2000V2 (200W) is the smallest and lightest solar generator with capacity of 2kWh on a global scale*



- Solar generators typically combines power station with solar panels, extended outdoor camping trip require continuous power to support power station, solar generators can significantly increase the energy storage capacity, thereby extending usage time and enhancing convenience.
- For instance, a 2kWh power station paired with a 200W solar panel provides greater energy efficiency than traditional storage products. Among the previously selected list of companies, Jackery E2000 V2 and Jackery SolarSaga 200W leads globally with its lightweight design for both 2kWh power station and solar panels. Consequently, **Jackery SG2000V2** is the smallest and lightest option available on a global scale.



Comparing key performance of solar generators, Jackery SG3000V2 (200W) is the smallest and lightest solar generator with capacity of 3kWh on a global scale*

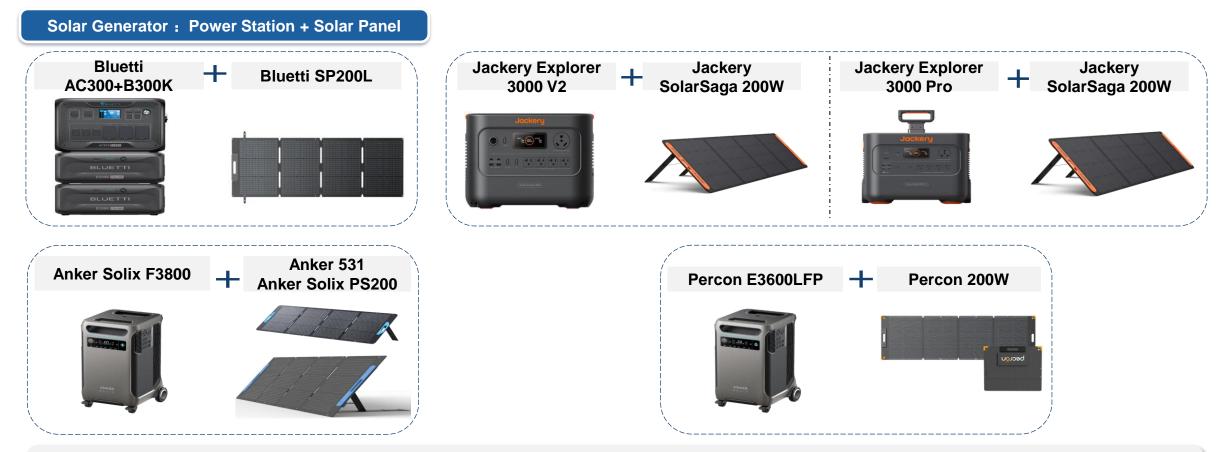
Solar Generator	Product Name	Capacity(Wh) /Power(W)	Weight(kg)	Volume(cm ³)	Weight per watt-hour(g/Wh)/ Weight per watt (g/W)	Volume per watt-hour (cm³/Wh)/ Volume per Watt(cm³/W)
Bluetti-Solar	Bluetti AC300+B300K	2764.8Wh	51kg	95,451.3cm ³	18.4g/Wh	34.5cm³/Wh
Generator	Bluetti SP200L	200W	7.8kg	25,827.9cm ³	39g/W	129.1cm³/W
Jackery-Solar	Jackery-Solar Generator SG3000V2 Jackery SolarSaga 200W	3072Wh	27kg	41236cm ³	8.8g/Wh	13.4cm³/Wh
		200W	6.2 kg ± 0.3 kg	13,579.2cm ³	31g/W	67.9cm³/W
Jackery-Solar	Jackery Explorer 3000 Pro	3024Wh	29kg	63028cm ³	9.6g/Wh	20.8cm³/Wh
Generator	Generator Jackery SolarSaga 200W		6.2 kg ± 0.3 kg	13,579.2cm ³	31g/W	67.9cm ³ /W
	Anker Solix F3800	3840Wh	60kg	100,779.1cm ³	15.6g/Wh	26.2cm ³ /Wh
Anker-Solar Generator	Anker 531	200W	7.4kg	20,588.4cm ³	46g/W	102.9cm³/W
	Anker Solix PS200	200W	9.2kg	17,212.1cm ³	37g/W	86.1cm ³ /W

• If home encounters sudden power outages or other natural disasters, it requires higher power, solar generators can significantly increase the energy storage capacity, thereby extending usage time and enhancing convenience.

For instance, a 3 kWh power station paired with a 200W solar panel provides greater energy efficiency than traditional storage products. Among the previously selected list of companies, Jackery E3000 V2 and Jackery SolarSaga 200W leads globally with its lightweight design for both 3kWh power station and solar panels. Consequently, Jackery SG3000V2 (200W) is the smallest and lightest option available on a global scale.



Comparing key performance of solar generators, Jackery SG3000V2 (200W) is the smallest and lightest solar generator with capacity of 3kWh on a global scale*



- If home encounters sudden power outages or other natural disasters, it requires higher power, solar generators can significantly increase the energy storage capacity, thereby extending usage time and enhancing convenience.
- For instance, a 3 kWh power station paired with a 200W solar panel provides greater energy efficiency than traditional storage products. Among the previously selected list of companies, Jackery E3000 V2 and Jackery SolarSaga 200W leads globally with its lightweight design for both 3kWh power station and solar panels. Consequently, Jackery SG3000V2 (200W) is the smallest and lightest option available on a global scale.



Comparing key performance of solar generators, Jackery SG3000V2 (500W) is the smallest and lightest solar generator with capacity of 3kWh on a global scale*

Solar Generator	Product Name	Capacity(Wh) /Power(W)	Weight(kg)	Volume(cm ³)	Weight per watt-hour(g/Wh)/ Weight per watt (g/W)	Volume per watt-hour (cm³/Wh)/ Volume per Watt(cm³/W)
Bluetti-Solar Generator	Bluetti AC300+B300K	2,764.8Wh	51kg	95,451.3cm ³	18.4g/Wh	34.5cm³/Wh
Generator	Bluetti SP200L	200W	7.8kg	25,827.9cm ³	39g/W	129.1cm ³ /W
Jackery-Solar Generator	Jackery Explorer 3000 V2	3,072Wh	27kg	41,236cm ³	8.8g/Wh	13.4cm³/Wh
SG3000V2	Jackery SolarSaga 500W	500W	10.5kg±0.5 kg	50,817.9cm ³	21g/W	101.6cm ³ /W
Jackery-Solar	Jackery Explorer 3000 Pro	3,024Wh	29kg	63,028cm ³	9.6g/Wh	20.8cm³/Wh
Generator	Jackery SolarSaga 500W	500W	10.5kg±0.5 kg	50,817.9cm ³	21g/W	101.6cm ³ /W
Ecoflow-Solar	Ecoflow Delta 3000	3200Wh	45kg	75,285.6cm ³	14.1g/Wh	23.5cm ³ /W
Generator	Ecoflow 500W, (125Wx4 Bifacial)	500W	16.8kg	62,203.7cm ³	33.6g/W	124.4cm ³ /W
Ecoflow Solar	Ecoflow Delta Pro	3600Wh	45kg	75,742.8cm ³	12.5g/Wh	21cm ³ /W
Ecoflow-Solar Generator	Ecoflow 500W, (125Wx4 Bifacial)	500W	16.8kg	62,203.7cm ³	33.6g/W	124.4cm ³ /W

• Due to limited solar panels in 500W, 2*200W is selected for comparison with 500W. The solar panel of Bluetti SP200L has a specification of 200 watts, when it combines with 3kWh, it requires to 2*Bluetti SP200L.

• A 3 kWh power station paired with a 500W solar panel provides greater energy efficiency than traditional storage products. Among the previously selected list of companies, Jackery E3000 V2 and Jackery SolarSaga 500W leads globally with its lightweight design for both 5kWh power station and solar panels. Consequently, Jackery SG3000V2 is the smallest and lightest option available on a global scale.



Comparing key performance of solar generators, Jackery SG3000V2 (500W) is the smallest and lightest solar generator with capacity of 3kWh on a global scale*





- Due to limited solar panels in 500W, 2*200W is selected for comparison with 500W. The solar panel of Bluetti SP200L has a specification of 200 watts, when it combines with 3kWh, it requires to 2*Bluetti SP200L.
- A 3 kWh power station paired with a 500W solar panel provides greater energy efficiency than traditional storage products. Among the previously selected list of companies, Jackery E3000 V2 and Jackery SolarSaga 500W leads globally with its lightweight design for both 5kWh power station and solar panels. Consequently, Jackery SG3000V2 is the smallest and lightest option available on a global scale.



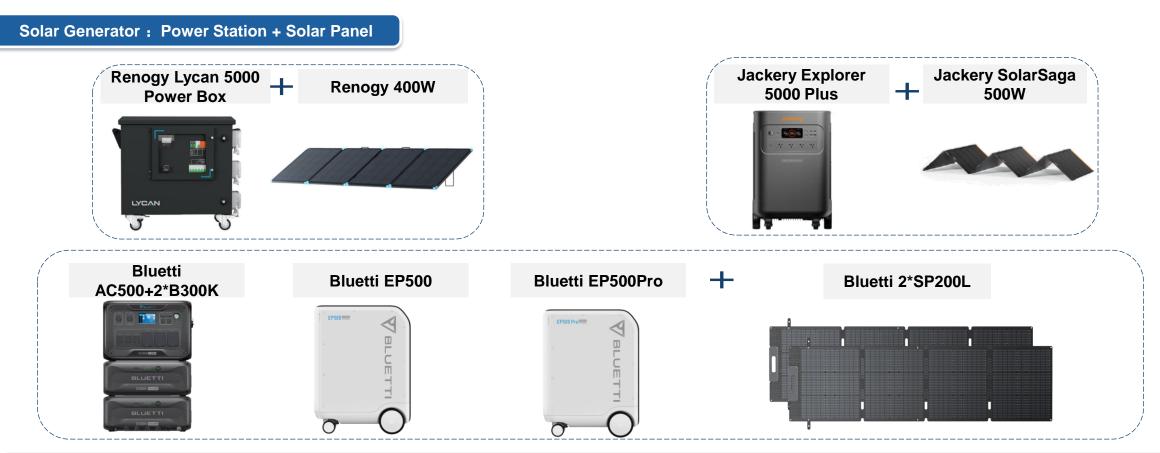
Comparing key performance of solar generators, Jackery SG5000Plus (500W) is the smallest and lightest solar generator with capacity of 5kWh on a global scale*

Solar Generator	Product Name	Capacity(Wh) /Power(W)	Weight(kg)	Volume(cm ³)	Weight per watt-hour(g/Wh)/ Weight per watt (g/W)	Volume per watt-hour (cm³/Wh)/ Volume per Watt(cm³/W)
Renogy-Solar	Renogy Lycan 5000 Power Box	4800Wh	122kg	307,474.1cm ³	25.4g/Wh	64.1cm³/Wh
Generator	Renogy 400W	400W	13.7kg	49,159.2cm ³	34.3g/W	122.9cm ³ /W
Jackery-Solar Generator	Jackery Explorer 5000 Plus	5040Wh	61kg	104,844.9cm ³	12.1g/Wh	20.8cm³/W
SG5000Plus	Jackery SolarSaga 500W	500W	10.5kg±0.5 kg	50,817.9cm ³	21g/W	101.6cm³/W
Bluetti-Solar Generator	Bluetti AC500+2*B300K	5529.6Wh	89kg	132,262.2cm ³	16.1g/Wh	23.9cm³/Wh
	Bluetti EP500	5120Wh	75.8kg	132,012cm ³	14.8g/Wh	25.8cm ³ /W
	Bluetti EP500 Pro	5120Wh	83kg	132,012cm ³	16.2g/Wh	25.8cm ³ /Wh
	Bluetti SP200L	200W	7.8kg	25,827.9cm ³	39g/W	129.1cm ³ /Wh

- Due to limited solar panels in 500W, 2*200W and 400W are selected for comparison with 500W. The solar panel of Bluetti SP200L has a specification of 200 watts, when it combines with 5kWh, it requires to 2*Bluetti SP200L.
- A 5kWh power station paired with a 400-500W solar panel provides greater energy efficiency than traditional storage products. Among the previously selected list of companies, Jackery E5000 Plus and Jackery SolarSaga 500W leads globally with its lightweight design for both 5kWh power station and solar panels. Consequently, **Jackery SG5000Plus is the smallest and lightest option available on a global scale.**



Comparing key performance of solar generators, Jackery SG5000Plus (500W) is the smallest and lightest solar generator with capacity of 5kWh on a global scale*



- Due to limited solar panels in 500W, 2*200W and 400W are selected for comparison with 500W. The solar panel of Bluetti SP200L has a specification of 200 watts, when it combines with 5kWh, it requires to 2*Bluetti SP200L.
- A 5kWh power station paired with a 400-500W solar panel provides greater energy efficiency than traditional storage products. Among the previously selected list of companies, Jackery E5000 Plus and Jackery SolarSaga 500W leads globally with its lightweight design for both 5kWh power station and solar panels. Consequently, Jackery SG5000Plus is the smallest and lightest option available on a global scale.



The development of off-grid power station is driven by several key factors: the continuous advancement of technology, the expansion of application scenarios, and the rise of high-capacity products



Outdoor activities are popular, with a significant demand for applicant scenarios





- Performance Improvements: With the rapid development of the global new energy industry, lithium-ion battery technology has continued to advance, and its cost-effectiveness has continued to increase. It has gradually replaced other secondary batteries such as lead-acid batteries and become the first choice for off-grid power station.
- **Cost reduction:** Driven by the new energy vehicle and power station industries, domestic power and power station battery companies have accelerated their production capacity, and the expansion of scale advantages has further reduced the price of lithium-ion batteries.
- Improved safety: The development of new high-performance, low-cost battery materials and corresponding electrochemical systems, the exploration of efficient processing and production technologies, the promotion of overall technological progress in the industrial chain, and the improvement of the safety of lithium-ion batteries.
- **Cultural traditions:** Europe and the United States have a long history of outdoor activities, and people have always been devout and enthusiastic about the outdoors and sunshine. At the same time, the country has strong per capita consumption capacity, and many people participate in outdoor activities such as camping. China's outdoor interactive market started late, but due to the impact of the epidemic, people's acceptance and participation in outdoor activities have increased significantly.
- Natural disasters: Compared with 1980 to 1999, the frequency of major natural disasters, the number of people affected and the scale of economic losses increased from 2000 to 2019, which means that the post-disaster emergency response field should receive global attention. In this context, portable power station supplies and small household power station equipment have become key emergency power solutions.

Rise in high-capacity products



- Increased energy density: The energy density of lithium batteries continues to increase, which enables portable power station devices to store more energy without increasing their size, thus improving the device's battery life.
- Increase in power: The increase in energy density has also driven the development of portable power station towards home power statio. Home power station can use lithium batteries with higher energy density to store more electricity to meet the needs of households during peak power hours or provide backup power when the power grid is unstable.

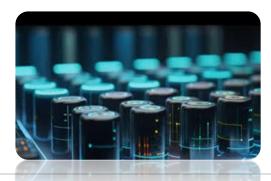
The further reduction of raw material costs, the continuous improvement of penetration rate and the expansion of household powerable station power supply will become the future development trend

Cost reduction

 With technological progress, expansion of production scale and improvement of product integration, the unit manufacturing cost of lithium batteries and the average standardized kilowatt-hour cost of household power station systems have rapidly decreased.



• In the future, as electricity prices continue to rise and the cost of photovoltaic storage continues to fall, the gap between the two is expected to widen, and the economic benefits of power station will be highlighted.



The penetration rate continues to increase

- Modern household appliances are gradually developing towards portability, such as laptops, drones, portable speakers, etc. These devices are increasingly used in outdoor activities, which has promoted the application and popularization of portable power station.
- With increased environmental awareness, people are more inclined to choose clean and renewable energy solutions.As a green energy product, off-grid power station has increased its market acceptance and penetration.



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Expanding to home power station

- Among the global household electricity prices, the electricity costs in developed countries such as Europe and the United States are relatively high, resulting in a greater demand for power station in overseas households.
- Household power station and portable power station are similar in technology and industrial chain distribution, so the transition from high-power portable power station to household power station is not a big span. In addition, the market size of the household power station industry exceeds that of portable power station, indicating that its subsequent development space is broader.



Source: Frost & Sullivan

Domestic policies to promote the outdoor economy are actively driving the growth of the portable power station market, overseas markets are further promoting the expansion of the home power station by providing corresponding subsidies for these stations

Relevant policies on China's power station market

Policy Name	Year of release	Specific description
《Guiding Opinions on Promoting the Development of Energy Electronics Industry》	January 2023	 By 2025, significant breakthroughs will be made in industrial technological innovation, the level of industrial base upgrading and industrial chain modernization will be significantly improved, and the industrial ecosystem will be basically established. Deeply promote the six key tasks of coordinated and integrated development of the entire energy electronics industry chain, as well as three special actions such as the action to enhance the supply capacity of solar photovoltaic products and technologies, the action to enhance the supply capacity of power station products and technologies, and the action to enhance the supply capacity of key information technology products in energy electronics, to promote the deep integration of modern information and energy technologies, photovoltaics and powera station, etc.
《Notice on the coordinated and stable development of the lithium-ion battery industry chain》	November 2022	• Adhere to scientific planning and promote the orderly layout of the lithium battery industry; strengthen supply and demand docking, ensure the stability of the industrial chain and supply chain, strengthen monitoring and early warning, and improve the ability to provide public services; strengthen supply and demand docking, ensure the supply of high-quality lithium battery products; optimize management services, and create a good environment for industrial development.
《Guiding Opinions on Promoting the Healthy and Orderly Development of Camping, Tourism and Leisure》	November 2022	• Give full play to the driving role of tourism, promote the coordinated development of all links in the upstream and downstream industrial chains of camping tourism and leisure, and extend the camping tourism and leisure industrial chain. Strengthen the integration and innovation of business formats, and promote the integration of camping with culture, sports and other industries.
《Guiding Opinions on Further Promoting Electric Energy Substitution》	March 2022	• Expand the field of electricity substitution, develop integrated energy services, and increase the proportion of electricity in end-use consumption. Comprehensively promote the green and low-carbon transformation of end-use energy, actively absorb renewable energy, systematically improve energy utilization efficiency, and promote the accelerated construction of a modern energy system that is clean, low-carbon, safe, and efficient.

Domestic policies to promote the outdoor economy are actively driving the growth of the portable power station market, overseas markets are further promoting the expansion of the home power station by providing corresponding subsidies for these stations

Overseas policies to encourage power station market					
Policy Name	Country	Specific description			
Home power station Tax Credit	Sweden	• Starting in 2021, tax breaks will be provided to individuals who install home power station systems.			
Renewable Energy Act	Germany	 In terms of tax refunds:the purchase of household photovoltaic and power station systems is exempt from value-added tax (about 19%): the import, purchase and installation of small rooftop photovoltaic and power station systems are all exempt from value-added tax. In terms of subsidies: the "Power station Plus" plan in the Berlin area subsidizes 300 euros for each KW of power station that is matched with the photovoltaic system. 			
Solar power station Rebate Program	Poland	 The Polish government has increased subsidy levels for residential PV and storage installations under its tax rebate scheme. 			





Introduction of the Research

Global Off-Grid Power Station Equipment

3 Appendix



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