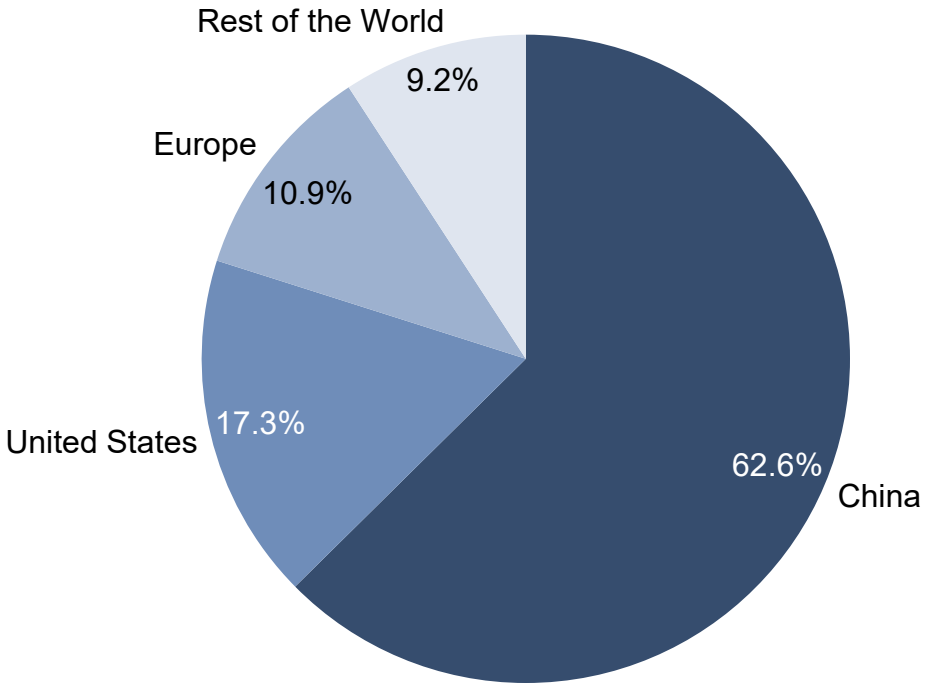
FROST & SULLIVAN

2024 GLOBAL PORTABLE POWER STATION MARKET RESEARCH REPORT

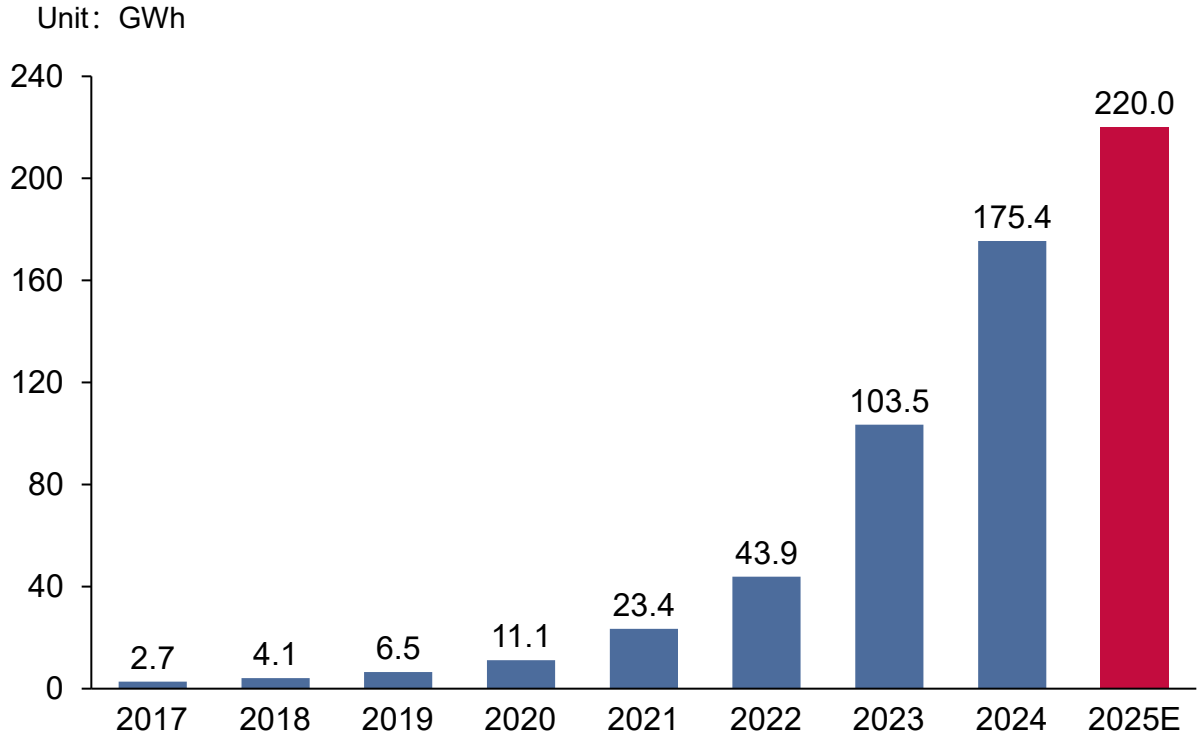
April, 2025

Since 2019, the development of global energy storage industry has been accelerating; by 2025, the newly installed capacity of global energy storage industry is expected to reach 220.0 GWh.

Proportion of Newly Installed Capacity of Global Energy Storage Industry, 2024



Newly Installed Capacity of Global Energy Storage Industry, 2017-2025E



- Since 2019, the global energy storage industry has experienced an accelerated development. Over the past five years from 2020 to 2024, the CAGR of global newly installed capacity reached 99.4%, demonstrating a trend of doubling each year. Major regions such as the United States and Europe have become important forces that drive the development of global energy storage industry. In 2024, the newly installed capacity of global energy storage industry reached 175.4 GWh, with an increase by 69.5% from 2023. The market shares of the United States and Europe reached approximately 30%. The newly installed capacity of global energy storage industry is projected to increase to 220.0 GWh in 2025. The energy storage industry in the United States and Europe is expected to maintain a stable growth, whilst emerging markets, such as Saudi Arabia and other countries in the Middle East, are beginning to rise.

Source: IEA, CESA, EESA, Frost & Sullivan Analysis

A portable power station is a small energy storage device equipped with a built-in lithium-ion battery with the capacity ranging from 100Wh to 3,000Wh, suitable for various scenarios including outdoor travel, home backup power, vehicle backup power, emergencies, outdoor operations, etc.

		Classification Criteria	Main Features	Application Scenarios	Representative Products
Portable Power Station	By Capacity	< 500Wh	• Compact and lightweight, easy to carry, and typically weighing a few kilograms. • Capable of providing charging for small electronic devices such as smartphones and tablets for multiple times.	Outdoor Activities	
		500Wh-1,000Wh	• Capable of meeting the power demands of multiple devices, such as simultaneously supplying power to computers, speakers and small refrigerators. Compared to lower-capacity product, its weight is slightly increased, allowing for longer usage durations for the devices.	Camping, Outdoor Travel, and Vehicle Backup Power	
		1,000Wh-3,000Wh	• Equipped with large energy reserve, it can simultaneously supply power to multiple high-power appliance such as refrigerators and induction cookers. While its portability is relatively limited, its mobility can be improved by adding wheels or handles.	Camping, Home Backup Power, and Emergencies	
Accessories	By Type	Power Pack	• Power pack can provide additional power for portable power stations, extending their using time.	Long-duration Power Usage Scenarios	
		Solar Panel	• Using sustainable solar energy to supply power to portable power stations in outdoor environments.	Outdoor Scenarios	

Note：Portable power station is also known as portable energy storage, power station, solar generator, etc.

Source: Frost & Sullivan Analysis

Value chain of global portable power station industry mainly comprises upstream raw material suppliers, midstream portable power station brands, and downstream sales channels including online channels such as Amazon, Rakuten, Yahoo, Taobao, JD.com and JUMIA, and offline channels such as Walmart, Home Depot and Costco.

Value Chain of Global Portable Power Station Industry

Upstream

Battery Cells

国轩高科 GUOXUAN HIGH-TECH

HTHIUM 海辰储能

LISHEN

EBAK

Inverters

TOPBAND

APsystems 昱能科技

powering tomorrow Growatt

Other Raw Materials

Midstream

Portable Power Station Brands

ECOFLOW

Hello Tech Bring Green Energy to All

ANKER SOLIX

BLUETTI

GOALZERO

Downstream

Online Sales Channels

amazon

ebay

Rakuten

YAHOO! JAPAN

淘宝网 Taobao.com

JD.COM

JUMIA

Offline Sales Channels

HOME DEPOT

Walmart

COSTCO WHOLESALE

Source: Frost & Sullivan Analysis

Global portable power station industry developed from initial growth to rapid expansion, followed by adjustment due to intensified competition, reviving with technical innovation, application expansion and policy support, and advancing towards directions of higher density, intelligence and sustainability.

Before 2016

Initial Growth

Before 2016, global portable power station industry was still in its infancy.

Outdoor power needs relied on small fuel generators or lead-acid batteries, which were noisy, polluting, heavy and inconvenient. Additionally, lithium-ion battery technologies were immature, costly, and lacked safety performance and energy density to meet market demands. Meanwhile, consumers' awareness was relatively low, and the market was undeveloped.

2016-2020

Rapid Expansion

From 2016 to 2020, increasing number of market participants drove rapid growth.

During this period, advancements in lithium-ion battery technologies, lower costs and rising power demand from outdoor activities and emergencies drove rapid growth in global portable power station industry. Global shipment grew from 101 thousand in 2017 to 2.1 million in 2020. Meanwhile, the capacities of portable power stations also increased, shifting from low capacity to medium-to-high levels to meet diverse power needs.

2021-2023

Adjustment Stage

From 2021 to 2023, global portable power station industry entered an adjustment stage.

Growing number of market participants and intensified competition led to fierce price competition and lower profitability. Some companies faced inventory pressure and declining shipment after reckless expansion. Some companies increased their R&D investment to improve product performances and expand applications. Meanwhile, industry standards and certification systems were also improved, which supported the sustainable development of global portable power station industry.

2024

Innovation Stage

In 2024, the market began to recover.

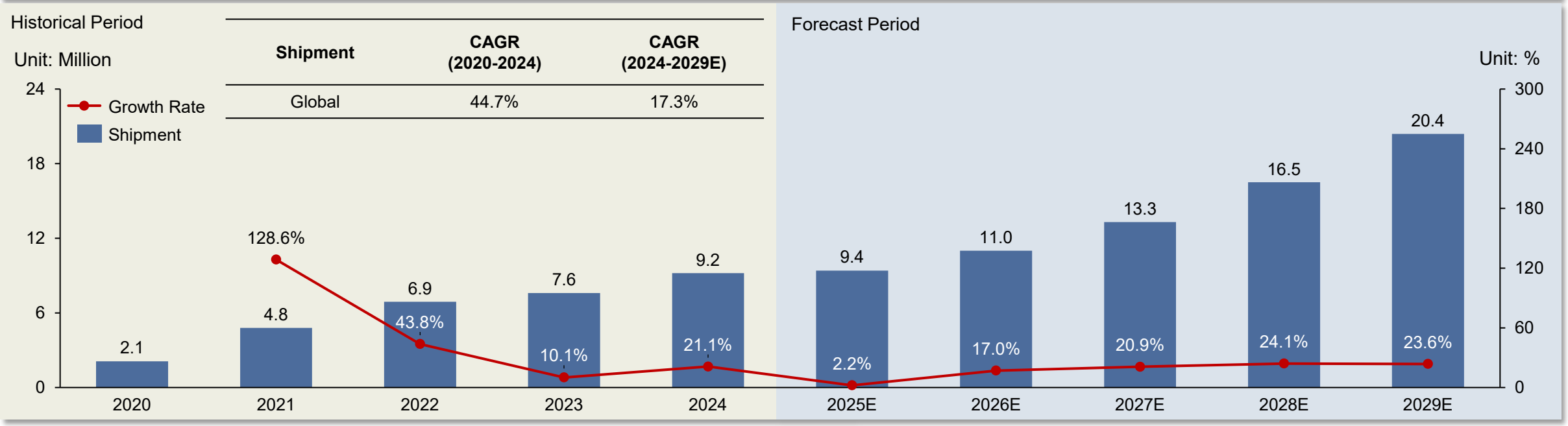
With continuous technical advancements, portable power stations have made significant improvements in energy density, lifespan and fast charging. Companies are actively exploring new application scenarios such as power supply for medical devices and drone operation. Additionally, policy support from various countries is also enhancing, reducing costs through measures such as subsidies and standard systems.

Source: Frost & Sullivan Analysis

Shipment of global portable power station industry reached 9.2 million in 2024, and is projected to reach 20.4 million by 2029 with further improvements in design and production technologies.

Shipment of Global Portable Power Station Industry, 2020-2029E

Shipment	CAGR (2020-2024)	CAGR (2024-2029E)
Global	44.7%	17.3%

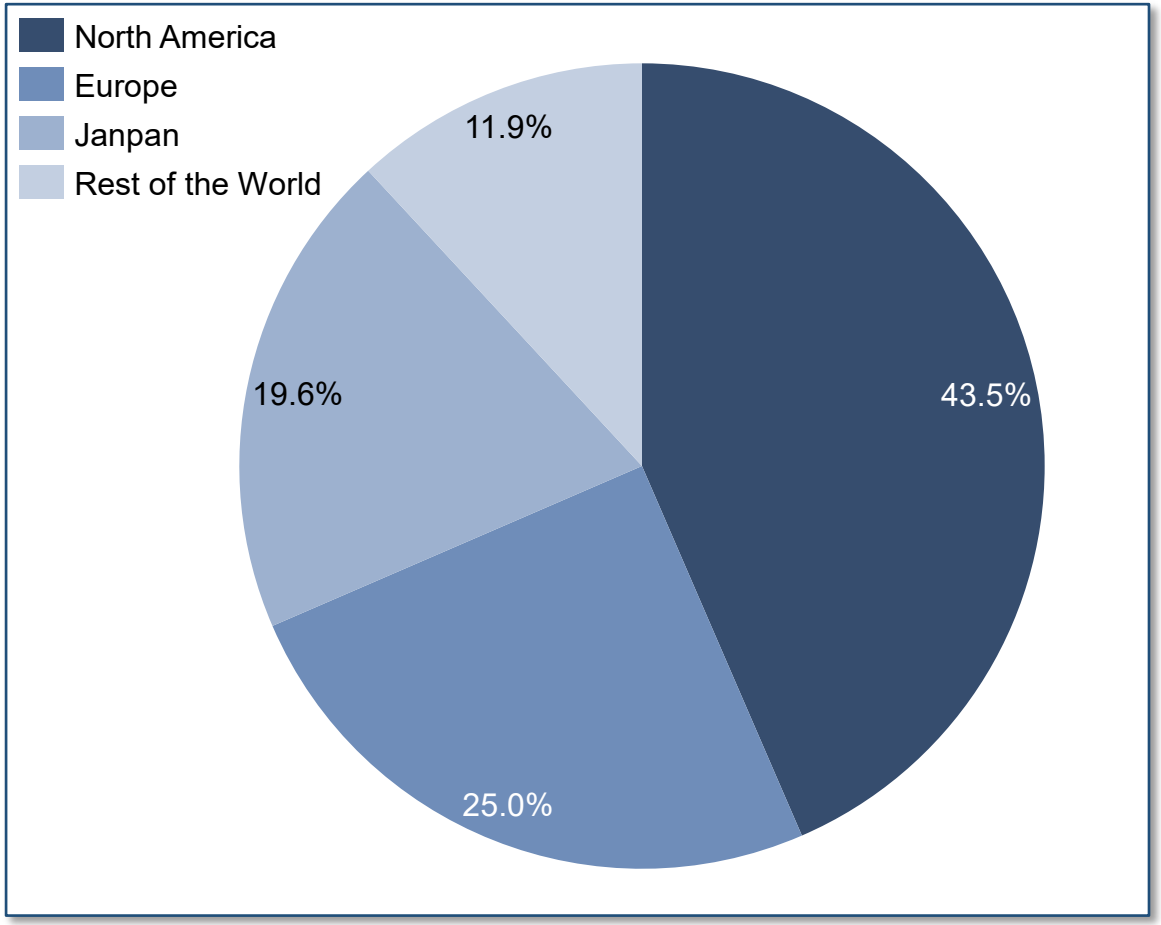


- In the past, power needs from outdoor activities and emergencies primarily relied on small fuel generators, which faced problems such as severe noise pollution, complex operation and environmental pollution. Consequently, energy storage products with clean energy technologies, such as portable power stations, began to emerge and experienced a continuous growth. Meanwhile, the rapid development of electric vehicle industry accelerated the maturity of upstream lithium-ion battery industry, providing strong support for the significant advancement of portable power station industry. In 2024, the shipment of global portable power station industry reached approximately 9.2 million, growing at a CAGR of 44.7% from 2020 to 2024.
- In 2025, the U.S. tariff policies are expected to result in a slowdown in market growth. With improvements in design and production technologies, and declining cost of battery cells, the market demand is anticipated to further increase. By 2029, the shipment of global portable power station industry is projected to reach approximately 20.4 million, representing a CAGR of 17.3% from 2024 to 2029.

Source: CIAPS, Frost & Sullivan Analysis

North America, Europe and Japan are key markets of portable power station, accounting for 43.5%, 25.0% and 19.6% in terms of shipment in 2024, respectively.

Share of Major Countries/Regions, in Terms of Shipment, 2024



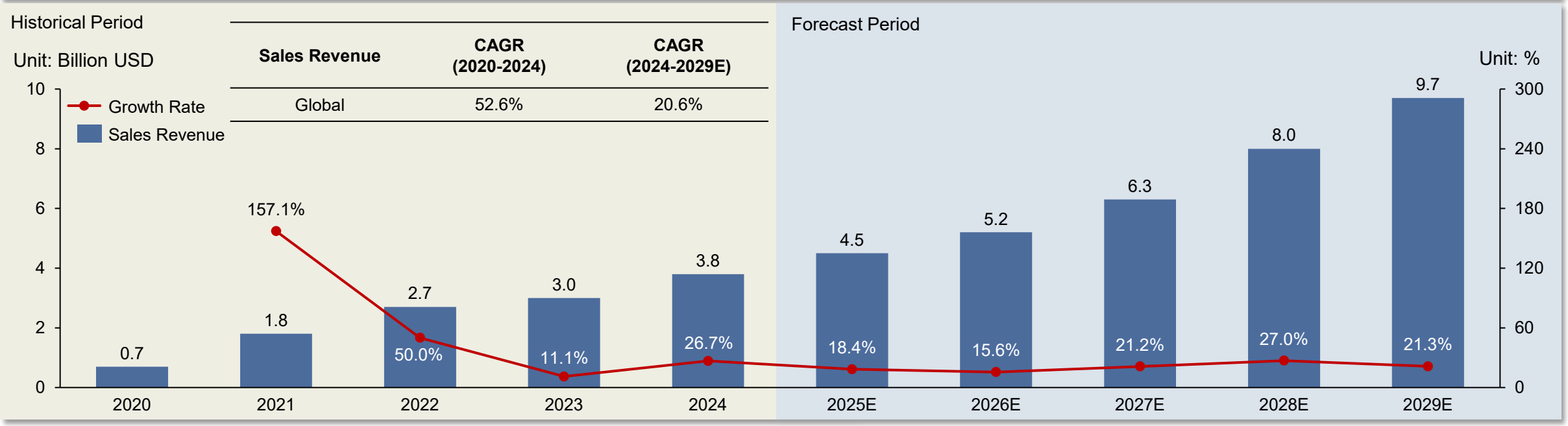
Key Findings

- North America, Europe and Japan are key markets of portable power station, with the shipment in these regions reaching 3.6 million, 2.3 million and 1.8 million in 2024, respectively. North America dominated the global market demand for portable power stations, accounting for 43.5%. As one of the origins of outdoor culture, North America exhibits a strong enthusiasm for outdoor activities, driving continuous growth in demand for portable power stations. Meanwhile, the stability issues of power grid in North America led to increasing demand for home backup power, further boosting the increase in shipment of portable power stations.
- Europe ranked second with a share of 25.0%. Governments in Europe have introduced a series of incentive policies to achieve energy transition and reduce carbon emissions, such as subsidies and tax incentives, that significantly stimulated consumer demand for portable power stations.
- Japan occupied an important position in global portable power station industry with a share of 19.6%. As a seismically active country, Japan has a strong public awareness of emergency preparedness. Therefore, as a portable and reliable emergency power device, portable power station has a wide market demand in Japan.
- Emerging markets are also witnessing rapid growth in demand for portable power stations. For instance, in Australia, frequent extreme weather events and rising electricity costs have driven an increase in demand for portable power stations. Australia also has a globally leading photovoltaic penetration rate, coupled with strong support from subsidy policies, which further stimulates market demand. Regions such as Africa, South America and Mexico have experienced accelerated development of portable power station industry due to growing demand for stable power supply, rising purchasing power of residents, and abundant clean energy resources. Additionally, the portable power station industry in China has also developed rapidly, due to favorable policy support and accelerated development of outdoor leisure activities.

Source: CIAPS, Frost & Sullivan Analysis

Sales revenue of global portable power station industry reached USD3.8 billion in 2024, and is projected to grow to USD9.7 billion by 2029, with a CAGR of 20.6% from 2024 to 2029.

Sales Revenue of Global Portable Power Station Industry, 2020-2029E



- In recent years, with growing demand for clean and renewable energy, global attention to environmental protection and sustainable development has been significantly strengthened. Portable power stations, as an innovative clean energy solution, are widely applied in various scenarios such as outdoor activities, emergency preparedness and household power consumption, greatly enhancing convenience in people's lives and work. Therefore, as a key device for efficient utilization of new energy, portable power station has witnessed rapidly growing demand, and global industry has experienced a significant growth. In 2024, the sales revenue of global portable power station industry reached approximately USD3.8 billion, growing at a CAGR of 52.6% from 2020 to 2024. By 2029, the sales revenue of global portable power station industry is projected to reach approximately USD9.7 billion, representing a CAGR of 20.6% from 2024 to 2029.

Note: Sales revenue of global portable power station industry includes sales revenue derived from portable power stations and accessories.

Source: CIAPS, Frost & Sullivan Analysis

United States, Europe and Japan are accelerating the introduction of energy storage related policies, driving rapid growth in global portable power station industry.

Key Policies and Regulations in Major Countries/Regions

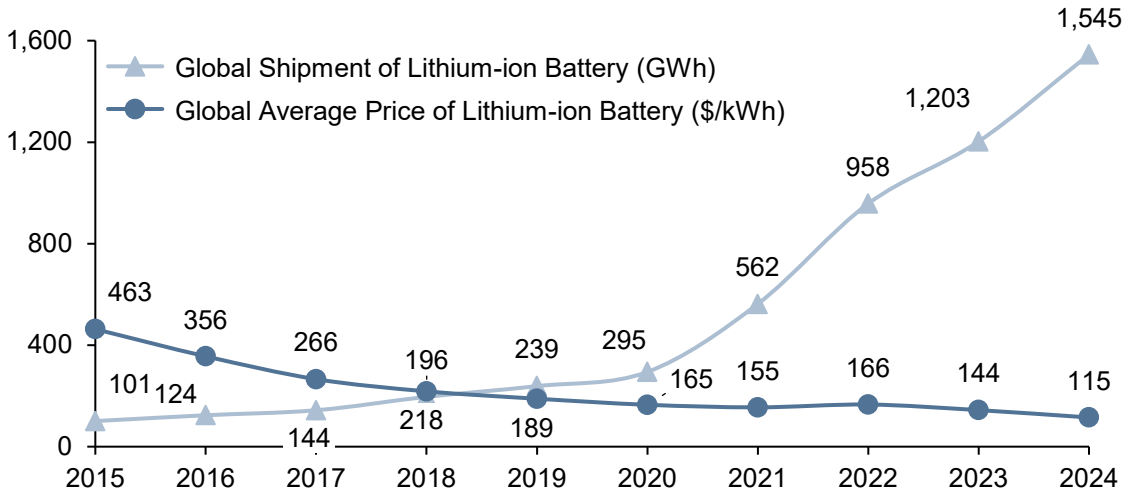
	Policies and Regulations	Issue Year	Description
United States	Inflation Reduction Act	2022	• Approximately $370 billion is allocated for energy security and climate initiatives, focusing on subsidies and support for clean energy manufacturing.
	Energy Storage Tax Incentive and Deployment Act	2021	• The act extends tax credits for energy property investments, including energy storage and battery technologies.
Europe	ETIP SNET, R&I Roadmap 2022-2031	2023	• A €4.5 billion investment is proposed for 63 R&D priority projects across nine applications, including cross-sector integration and grid-level energy storage.
	EU Batteries Regulation 2023	2023	• Accelerate EU clean energy project approvals and battery storage permits.
	Horizon 2020	2018	• Clearly support renewable energy storage technologies and a competitive battery industry chain.
Japan	Japan's Ministry of Economy, Trade and Industry spearheaded the establishment of the Portable Energy Storage Association.	2024	• Japan established the Portable Energy Storage Association to promote product development and ensure the widespread adoption of safe and reliable portable power stations in Japan.
	Storage Battery Industry Strategy	2022	• Japan aims to achieve carbon neutrality by 2050, with electrification as a high priority.

Source: Frost & Sullivan Analysis

On supply side, declining lithium-ion battery costs and improved capacity and output power have expanded the applications of portable power stations. Increased e-commerce penetration has further stimulated the market demand.

Declining Lithium-ion Battery Costs

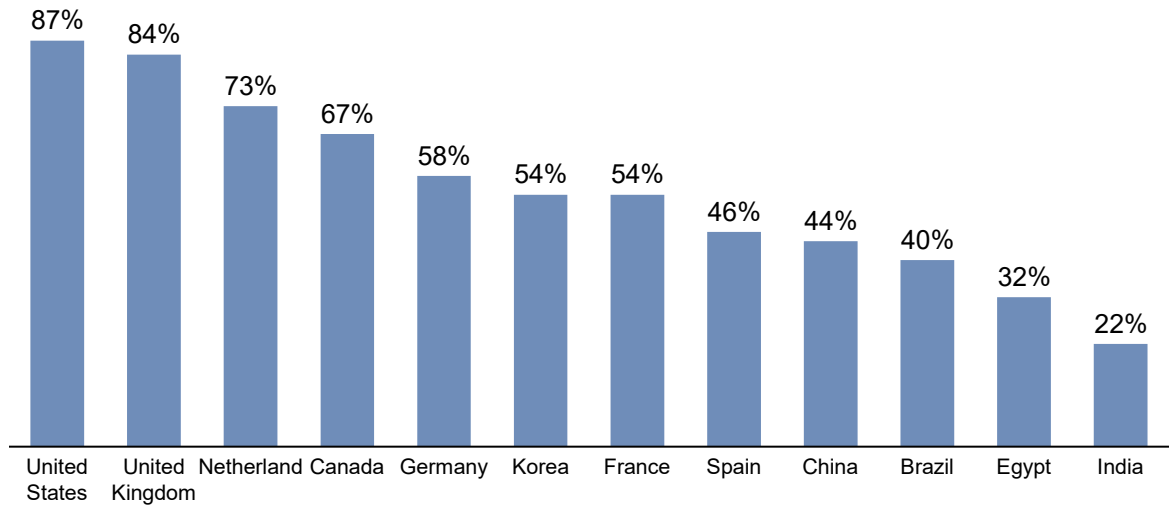
Global Lithium-ion Battery Shipment and Average Price, 2015–2024



- Driven by commercialization and technical advancements, lithium-ion battery costs have declined significantly, enhancing global acceptance of portable power stations. Over the past decade, global average price of lithium-ion battery decreased by 75.2%, from $463/kWh in 2015 to $115/kWh in 2024. The significant decrease in lithium-ion battery price is mainly attributed to technical advancements in battery system integration and development of automated production processes, which have laid a solid foundation for large-scale commercial applications, thereby driving a substantial increase in shipment from 101 GWh in 2015 to 1,545 GWh in 2024, with a CAGR of 35.4%. Further, declining lithium-ion battery costs and improved capacity and output power has greatly expanded the application scenarios of portable power stations, thereby stimulating the market demand.

Increased E-commerce Penetration

E-commerce Penetration Rates in Major Economies, 2024



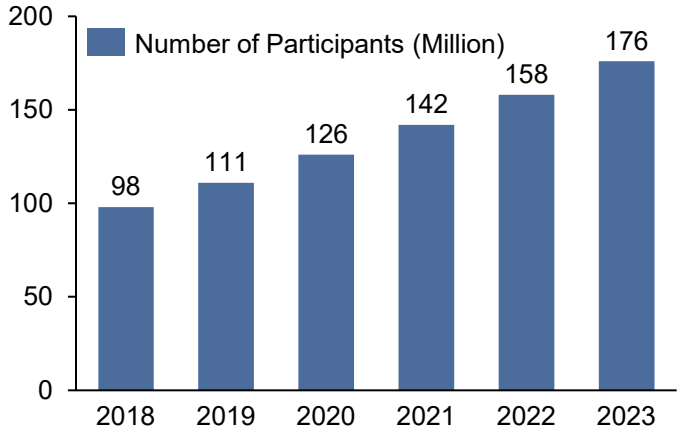
- Global e-commerce penetration continues to rise, providing strong support for portable power station companies to expand their overseas business layout. In 2024, the e-commerce penetration rates in the United States, the United Kingdom, Netherland, Canada, Germany, South Korea and France exceeded 50%, among which the e-commerce penetration rates in the United States and the United Kingdom surpass 80%. Portable power station companies are gradually shifting their sales channels towards e-commerce platforms. With the continuous expansion of online shopping user groups, the brands' customer bases have been significantly expanded, which enables them to break through the barriers in overseas markets at relatively low costs of customer acquisition, and seize market shares in global portable power station industry.

Source: IEA, Frost & Sullivan Analysis

On demand side, rising needs for outdoor power and home backup power, and clean energy advantages of portable power stations to replace small fuel generators, drive the market growth.

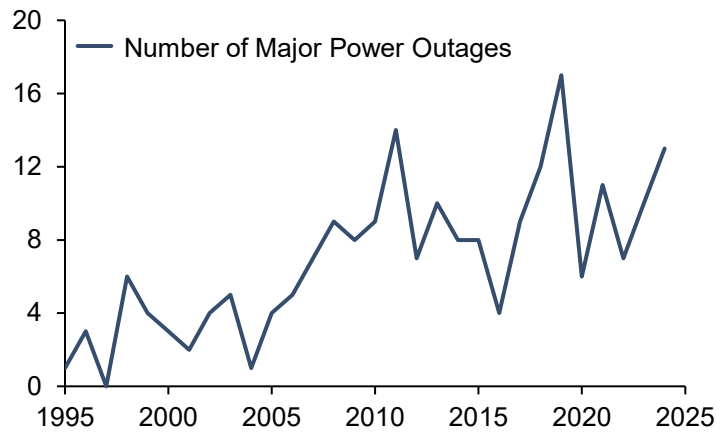
Global Demand for Outdoor Power and Home Backup Power is Rising

Outdoor Recreation Participants in the U.S.



- In recent years, consumers' leisure and entertainment habits have changed, with a significant decrease in the frequency of indoor recreation and group travel, while outdoor camping and RV travel are on the rise. Meanwhile, portable power station is widely favored by outdoor travel consumers due to its advantages of no noise, low pollution and portability. The increasing popularity of outdoor activities has led to a significant increase in the number of outdoor travelers, which boosted the demand for portable power stations.

Number of Major Power Outages*



- Over the past 30 years, extreme natural disasters have entered a period of high incidence, causing serious disturbances to the power systems. Combined with the surge in power demand brought about by the era of electrification, major power outages have entered a period of high incidence, with the number of major power outages reaching 13 in 2024. Therefore, the demand for home power backup continues to grow. With the advantages of high energy density, fast charging and discharging, and long cycle life, portable power station gradually becomes the mainstream choice for home backup power, and the market demand is expanding.

Replacing Traditional Fuel Generators

Category	Portable Power Station	Fuel Generator
Energy	**Electricity**	Diesel
Power	**1-3kW**	2-8kW
Size & Weight	**Light and can be carried by one person**	Heavy, requires two or more people to carry
Power Quality	**Sine wave alternating current with excellent power quality**	Ripple jitter with poor power quality
LCOE	**USD0.07/kWh**	USD0.1/kWh
O&M Costs	**Relatively high maintenance costs**	Almost no maintenance required
Pollution	**No pollution**	High grease and smoke emission
Noise	**No noise**	Loud noise

- Compared with traditional fuel generators, portable power station has prominent advantages. In recent years, portable power station has gradually replaced small fuel generators. Demand for portable power station in home backup power, emergency and rescue scenarios will be even broader. In the context of global new energy development, the cleanliness advantage of portable power station has certain inevitability in replacing small fuel generators, thereby promoting the development of global portable power station industry.

*Note: A major power outage must meet the criteria including: (1) it is not an outage planned by power suppliers; (2) it affects at least 1,000 people; (3) it lasts at least one hour; and (4) the total person-hours of disruption from the outage amount to at least 1 million person-hours.

Source: OIA, CIAPS, Frost & Sullivan Analysis

In the future, global portable power station industry will focus on intelligent upgrading, high-capacity product trends, and applications of new battery cell technologies.

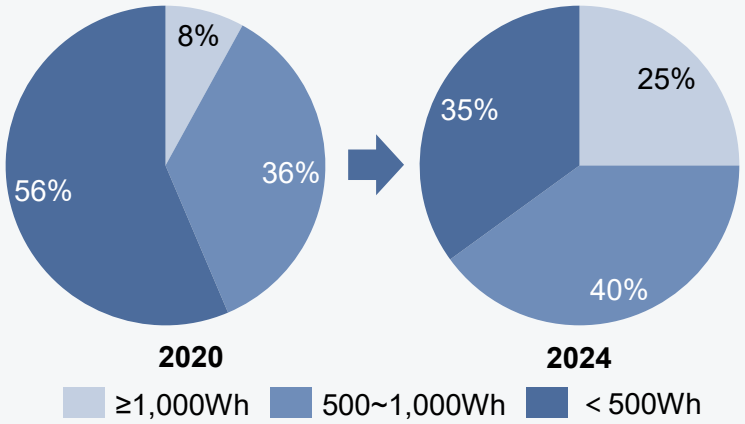
Intelligent Upgrading

- Intelligent upgrading is becoming a key direction for the development of portable power station industry. With continuous technical advancements, portable power station is gradually integrating with cutting-edge technologies such as the Internet of Things (IoT), big data and artificial intelligence (AI), and gradually transforming from traditional single function to intelligent management. Intelligent portable power station can accurately monitor battery status through real-time data monitoring and analysis, thereby optimizing charging and discharging strategies, improving system safety and extending service life. Additionally, intelligent system can automatically adjust output power according to user habits and environmental conditions, realizing efficient energy utilization. This intelligent development not only improves user experience, but also provides a wider range of application scenarios for portable power stations. In the future, with the deep integration of AI algorithms and the application of machine learning technology, the intelligence level of portable power stations will continue to improve, driving the industry towards higher efficiency, higher safety and greater convenience.

High-capacity Product Trends

- In the future, portable power station will gradually develop towards higher capacity. The continuous progress of battery technology, especially the development and application of high energy density batteries, enables portable power stations to achieve greater capacity in a smaller volume and weight. Meanwhile, with the popularization of outdoor activities and the rising consumption levels, the demand for the capacity and functionality of portable power stations continues to increase. Larger-capacity products can meet the needs in complex scenarios, thereby driving the continuou growth in market demand.

Shares of Portable Power Station by Different Capacities, 2020 VS 2024



Applications of New Battery Cell Technologies

- Technical innovation will become the core factor driving the future development of portable power station industry. In recent years, the development of solid-state battery technology has been particularly prominent. By replacing traditional liquid electrolytes with solid-state electrolytes, solid-state batteries have achieved significant improvements in energy density, safety and service life. In addition, fast charging technology is expected to be further optimized to achieve faster charging speeds. In the future, with continuous advancements in material science and optimization of battery design and production processes, the energy density of portable power station is expected to increase significantly, laying a solid foundation for diversified product applications and market expansion.

Comparison of Battery Cell Technologies

Dimension	Liquid Battery	Semi-solid-state Battery	Solid-state Battery
Electrolytes	Liquid organic electrolyte	Gel electrolyte	Solid-state electrolyte
Energy Density	≤350 Wh/kg	400-500 Wh/kg	≥500 Wh/kg
Safety	Requires strict BMS control	Localized thermal runaway suppression	Intrinsically safe
Cost	$100/kWh	$150/kWh	≥$400/kWh

Source: Frost & Sullivan Analysis

EcoFlow DELTA 3 Plus, powered by X-Core 3.0, achieves the fastest charging speed among 1kWh portable power stations globally, while maintaining 4,000 cycles (remaining over 80% capacity).

Main Brand	Main 1kWh Products	Capacity	Charging Time	Output Power	Number of Cycles	Retail Price
EcoFlow	EcoFlow DELTA 3 Plus	1,024Wh	56min	1,800W	4,000 cycles (remaining over 80%)	$649
	EcoFlow DELTA 2	1,024Wh	80min	1,800W	4,000 cycles (remaining over 80%)	$499
Hello Tech	Jackery Explorer 1000 V2	1,070Wh	1.7h	1,500W	4,000 cycles (remaining over 70%)	$799
Anker Innovation	Anker Solix C1000	1,056Wh	58min	1,800W	3,000 cycles (remaining over 80%)	$499
Bluetti	Bluetti AC180	1,152Wh	1.3h~1.8h	1,800W	3,500 cycles (remaining over 80%)	$439
Goal Zero	Yeti 1000X	983Wh	9h	1,500W	500 cycles (remaining over 80%)	$899.95
GRECELL	GRECELL-1000	999Wh	2h	1,000W	-	$699.99
ALLWEI	ALLWEI LiFePO4	1,008Wh	5.5~6.5h	1,200W	3,500 cycles (remaining over 70%)	$549

Source: Frost & Sullivan Analysis

There are numerous players in global portable power station industry, and the main participants include EcoFlow, Hello Tech, Anke Innovation, PowerOak and Goal Zero.

Main Participants	Introduction	Main Product Series
EcoFlow	• Founded in 2017, EcoFlow is a national high-tech enterprise in the field of portable power station and clean energy. EcoFlow is a global industry pioneer in portable power station and clean energy, with over 5 million users worldwide, products sold in over 140 countries and regions, and owned over 1,100 patented technologies. As of March 31, 2025, the cumulative global sales of its DELTA 2 Max reached 260 thousand.	 DELTA series  RIVER series
Hello Tech (stock code 301327)	• Founded in 2011, Hello Tech is mainly engaged in the research, development, production and sales of portable power station and home energy storage products. Hello Tech was listed on China GEM in September 2022, and has two major brands, including Jackery and Geneverse.	 Explorer series
Anker Innovation	• Founded in 2011, Anker Innovation specializes in the design, development and sales of smart accessories and smart hardware. Anker Innovation launched Anker SOLIX, a consumer-grade new energy brand and the Anker SOLIX home energy product series in 2023, which covers portable power station, balcony solar system and residential energy storage.	 Camping series  Flex series
PowerOak	• Founded in 2013, PowerOak is a national high-tech enterprise focusing on user-side PV energy storage solutions and energy storage products, with BLUETTI as its own brand of portable power station. BLUETTI's business covers many countries and regions around the world.	 Elite series  Apex series  Pioneer series
Goal Zero	• Founded in 2009, Goal Zero is a company specializing in the technical development and product sales of portable solar energy devices in the U.S., and was acquired by NRG, a U.S. energy giant, in 2014. Goal Zero has been committed to the innovation and design of portable power station products.	 Yeti series

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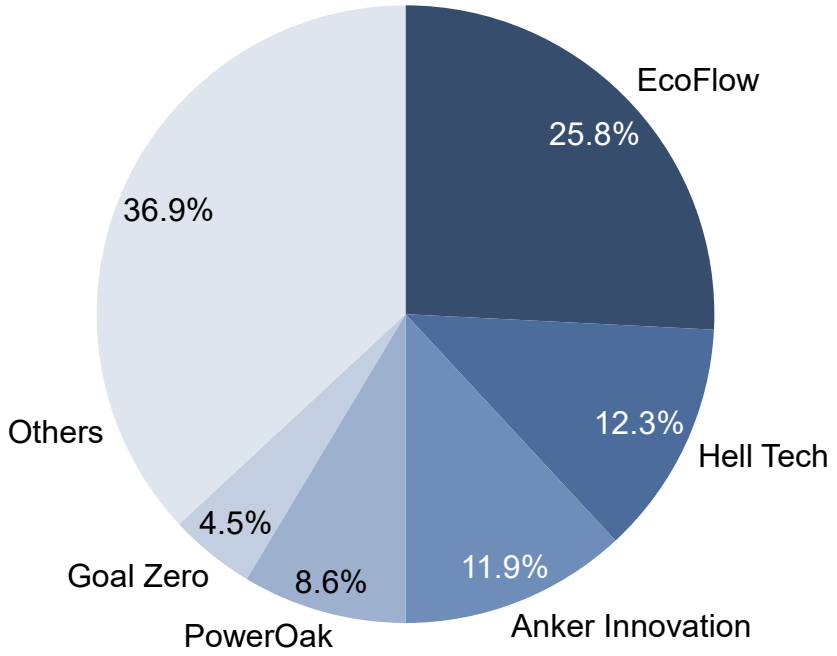
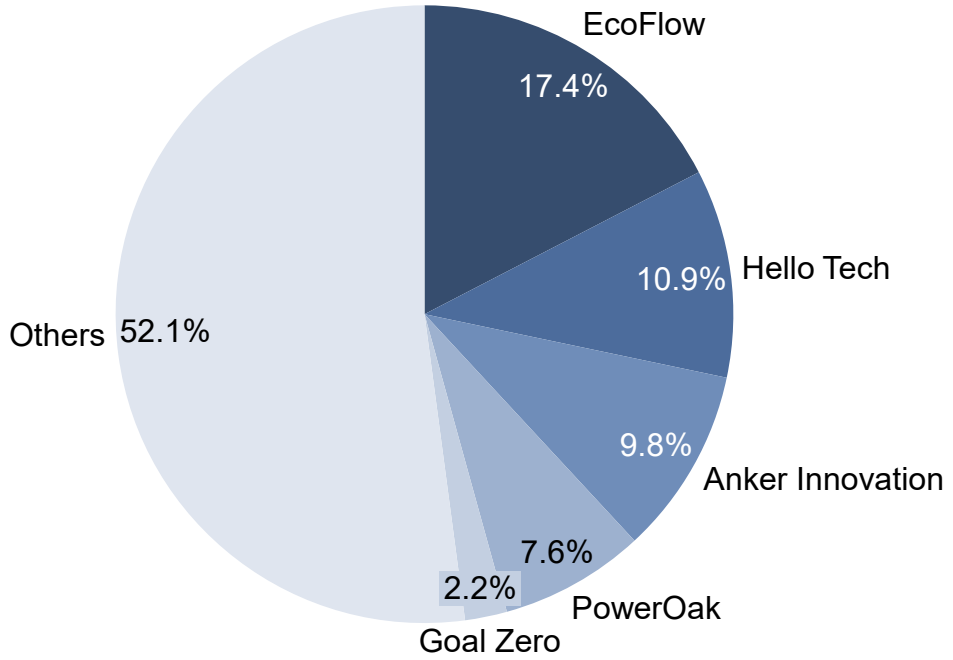
Source: Frost & Sullivan Analysis

Global portable power station industry is relatively concentrated. In 2024, the global top five companies accounted for 63.1% in terms of sales revenue and 47.9% in terms of shipment.

Competitive Landscape of Global Portable Power Station Industry, in Terms of Sales Revenue, 2024



Competitive Landscape of Global Portable Power Station Industry, in Terms of Shipment, 2024



- With the continuously increasing demand in global portable power station industry, a growing number of companies have entered this industry, committed to occupying a position in the fast-growing portable power station industry. The competition has been intensified. As of December 31, 2024, there were over 50 players in global portable power station industry. In 2024, EcoFlow ranked first in global portable power station industry, in terms of both sales revenue and shipment, with a market share of 25.8% and 17.4%, respectively.

Source: Annual Reports, Frost & Sullivan Analysis

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