GlobalData

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Market Intelligence

Solar and Wind Market Size

March 2024

Public عام

The pressing need to address climate change, increasing emission levels and demand for power, and energy security are some of the major factors that influenced the promotion and use of renewable power. Owing to their relative maturity, wind and solar technologies have grown substantially. However, with the advent of technology and logistics, solar power registered rapid growth in the last decade. Adoption in the early stages was not extensive, which resulted in the framing of policies and subsidies by various governments to facilitate market growth. Nevertheless, changes in perception and improvement in the supply chain resulted in a decline in cost, which enabled solar to compete without additional support in several countries. The reduction in cost will encourage governments to gradually phase out incentives, which would slow down the pace of deployment. On the other hand, new business models and intuitive financial instruments will ensure that solar technology continues to play a prominent role in the global power sector.

Table 1:Solar PV Modules and Inverters, Global, Market Drivers and Restraints Analysis		
Market drivers	1–2 yr	3–5 yr
Push for clean power generation sources will augment the global solar market	High	Medium
Decline in costs is expected to increase PV installations during the forecast period	Medium	Medium
Beneficial government policies will create new opportunities for market growth and expansion	High	Medium
Market restraints	1–2 yr	3–5 yr
Policy changes could hinder deployment rates in certain major markets	High	Medium
Lack of infrastructure and technical support to restrain the market	Medium	Low
Source: GlobalData Power Database [November 2023]		

Solar PV Modules & Inverters, Global, Market Size Analysis 2018-2027

The installation of solar PV modules globally is expected to increase at a CAGR of 6.9% during the forecast period. The transition to power generation using clean sources and drop in technology prices are expected to aid market growth. Ambitious initiatives in countries that are heavily reliant on fossil fuels such as in the Middle East, Africa, and Southeast Asia provide viable opportunities to developers and manufacturers. Owing to its relative maturity, the crystalline module technology will continue to be adopted widely, with an estimated installed capacity of 264.84GW in 2027, while the capacity of thin-film module technology was estimated at 24.44GW. The global market value is estimated to reach $55.60 billion during the forecast period in 2027 from $73.12 billion in 2022.

Figure 6: Solar PV Modules and Inverters, Global, Annual Solar PV Module Market Capacity (GW), 2018–27

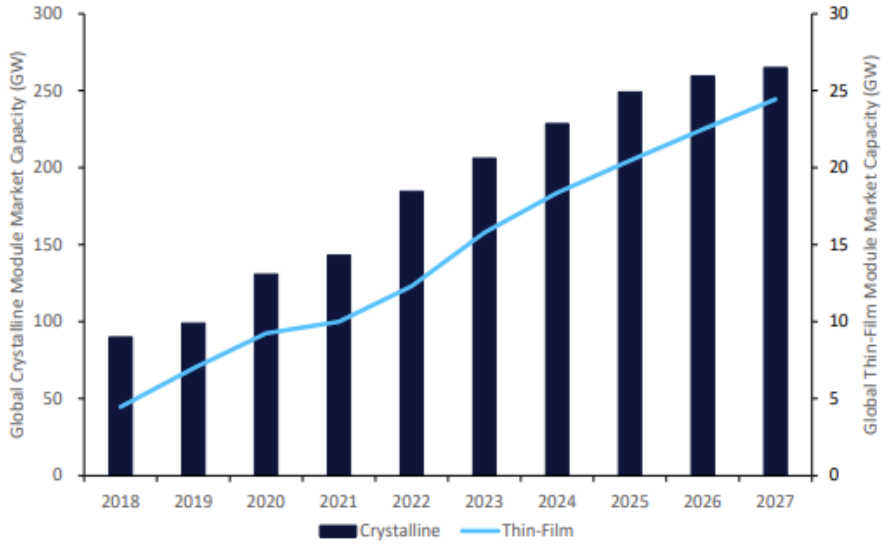

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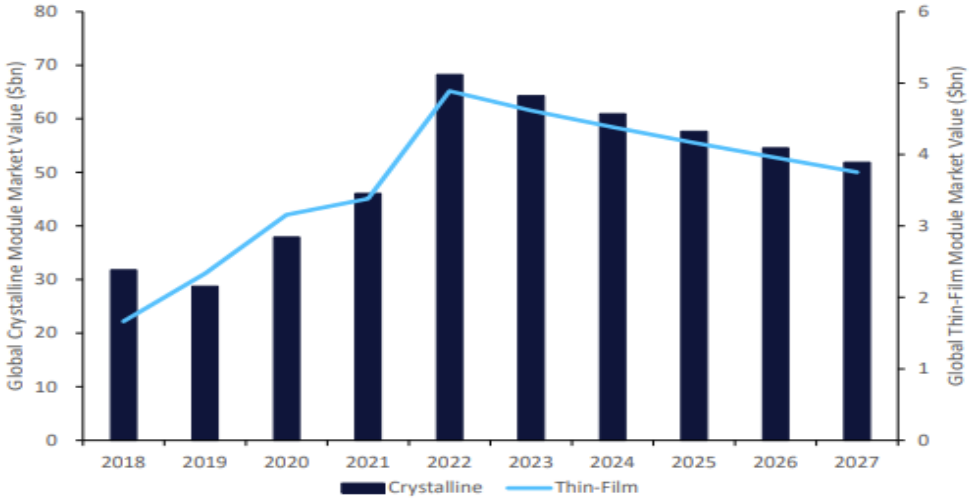
Figure 7: Solar PV Modules and Inverters, Global, Annual Solar PV Module Market Value ($bn), 2018–27



Source: GlobalData Power Database [December 2023]

Solar PV Modules & Inverters, Global, Market Size Analysis 2018-2027

The global solar PV inverter market reached 204.61GW in 2022, with the utility segment accounting for 55.86% of the capacity. The growing awareness of PV technology, favorable policies and subsidies, and a conscious move to transition from the excessive consumption of fossil fuel sources accelerated the growth of solar PV, which propelled the market for inverters. By the end of 2027, the annual installed capacity of solar PV inverters is estimated to reach 370.66GW. The utility segment will continue to dominate, and by 2027, the segment is estimated to reach 205.20GW. The residential and commercial segments are estimated to grow at a CAGR of 6.17% and 4.17%, respectively, during the forecast period. The global market value is estimated to reach $35.17 billion during the forecast period in 2027 from $17.59 billion in 2022.

Figure 8: Solar PV Modules and Inverters, Global, Annual Solar PV Inverter Market Capacity (GW), 2018–27

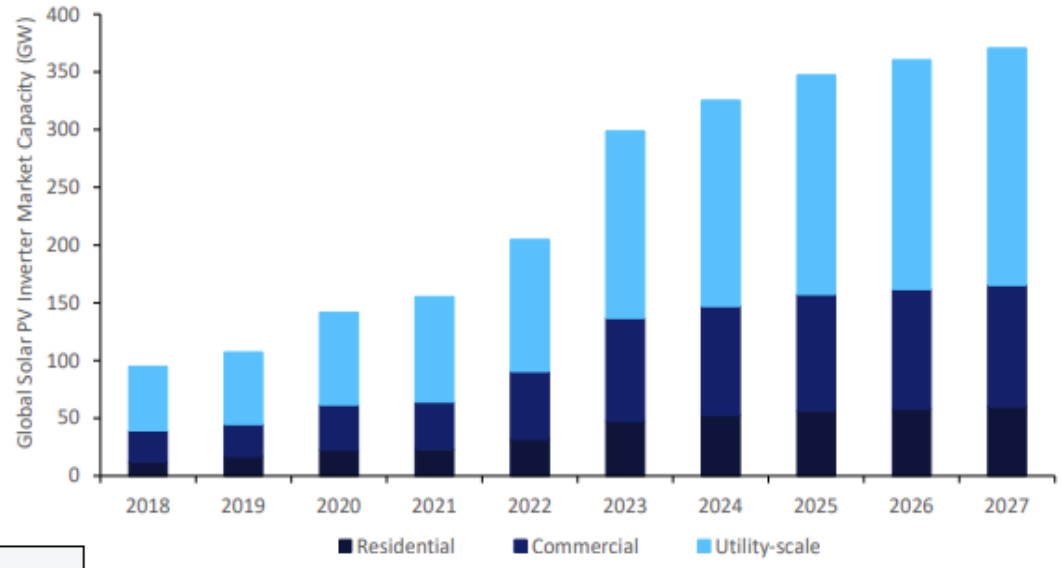


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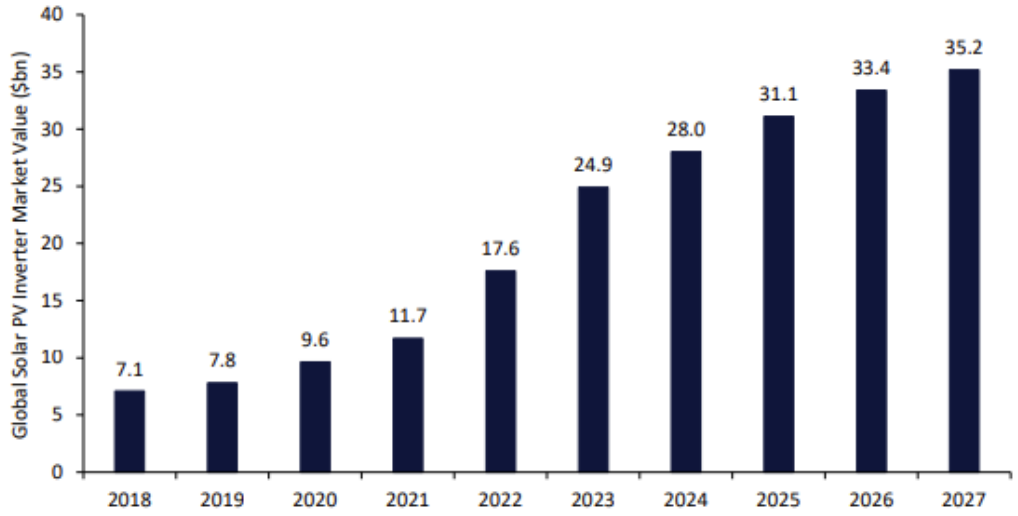
Figure 9: Solar PV Modules and Inverters, Global, Annual Solar PV Inverter Market Value ($bn), 2018–27



Source: GlobalData Power Database [December 2023]

The market for crystalline technology is more fragmented than that for thin-film technology. Crystalline technology is mature and easier to fabricate and, coupled with the demand for solar PV, forms a viable business opportunity for manufacturers to enter the market. The crystalline technology market is heavily oriented towards Asia, particularly China. LONGi Solar Technology Co Ltd, Trina Solar Co Ltd, and JA Solar Holdings Co Ltd are the three top manufacturers and they accounted for 56.7% of the global market in 2022.

In comparison to the crystalline technology market, the thin-film market is more consolidated with a few prominent players. The market leader is a US-based manufacturer, First Solar, with a share of 45.03% in the global thin-film market in 2022. Rest of the players shared 54.97% of the market.

Figure 10: Solar PV Modules and Inverters, Global, Solar PV Module Market, Competitive Landscape, Crystalline Technology, 2022

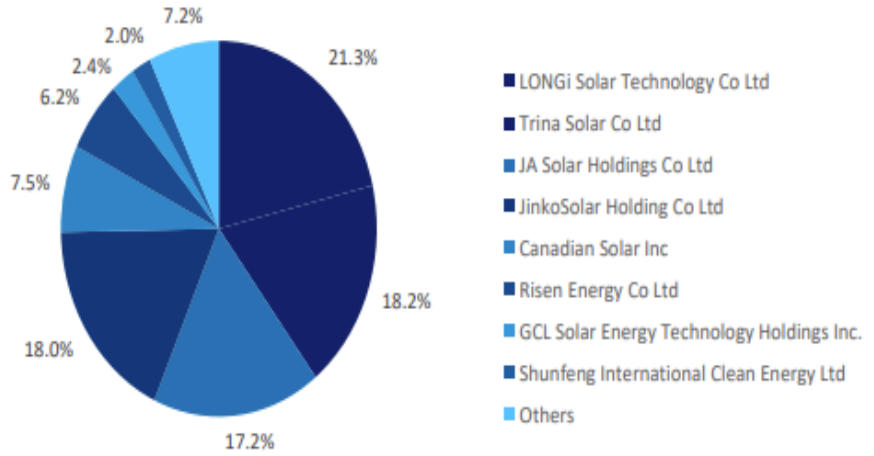
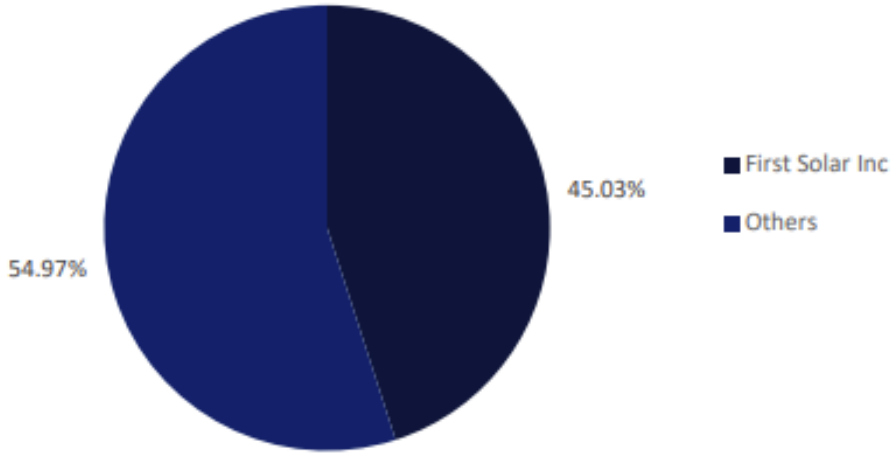


Figure 11: Solar PV Modules and Inverters, Global, Solar PV Module Market, Competitive Landscape, Thin-Film Technology, 2022



Source: GlobalData Power Database [December 2023]

Solar PV Modules & Inverters, Global, Solar, PV Inverter Market Competitive Landscape, 2022

Like the market for PV modules, the global PV inverter market is dominated by Chinese players. Huawei Technologies Co Ltd topped with 29% of the market share, followed by Sungrow Power Supply Co Ltd with approximately 23% in 2022, and Ginlong Technologies Inc accounted for approximately 8%. Some of the other significant players are Growatt New Energy Technology Co Ltd, Jiangsu Goodwe Power Supply Technology Co Ltd, and SMA Solar Technology AG with a market share of 6%, 5%, and 3%, respectively, in 2022.

Figure 12: Solar PV Modules and Inverters, Global, Solar PV Inverter Market, Competitive Landscape, 2022

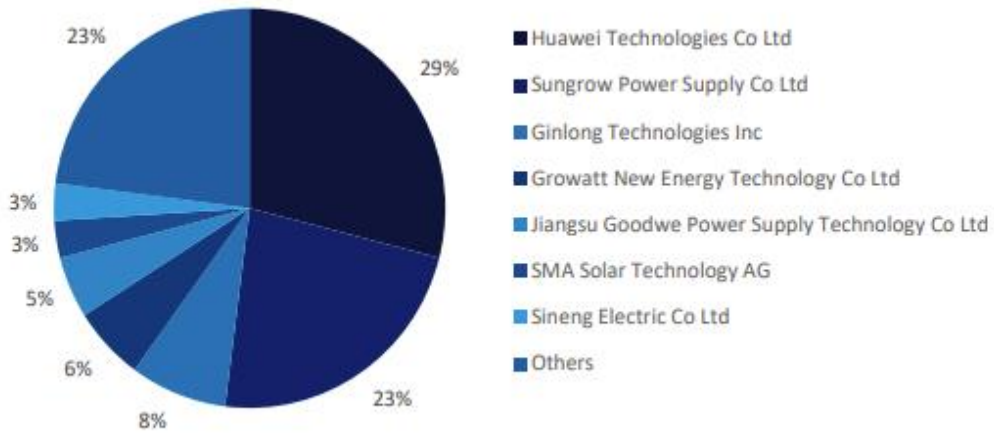


Table 8: Solar PV Modules and Inverters, Global, Solar PV Inverter Market, Competitive Landscape, 2022

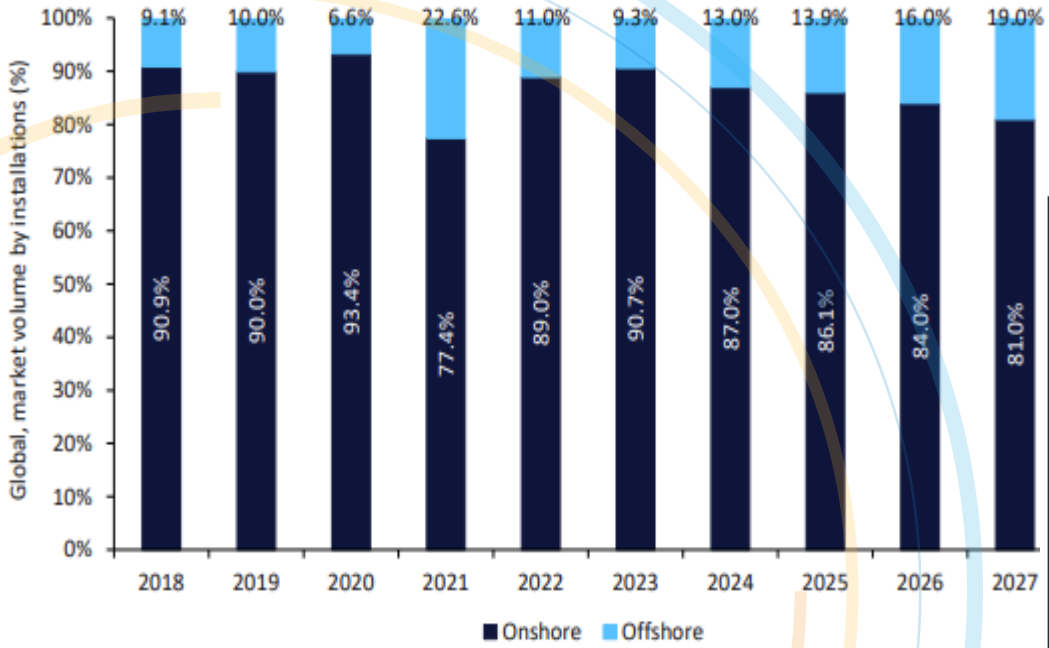
Solar PV Inverter Manufacturers	Market share (%)
Huawei Technologies Co Ltd	29%
Sungrow Power Supply Co Ltd	23%
Ginlong Technologies Inc	8%
Growatt New Energy Technology Co Ltd	6%
Jiangsu Goodwe Power Supply Technology Co Ltd	5%
SMA Solar Technology AG	3%
Sineng Electric Co Ltd	3%
Others	23%

Source: GlobalData Power Database [December 2023]

Wind Turbines, Global, Onshore and Offshore Capacity by Turbine size, 2018-2027

In 2018, the annual wind turbine installed capacity stood at 50.41GW (45.83GW onshore and 4.58GW offshore). The wind turbine market reported an average annual installation of 72.61GW during the historical period. In 2022, the annual wind turbine installation was 77.37GW (68.85GW onshore and 8.53GW offshore). Over the forecast period, the aggregate installation is expected to reach 590.90GW. In 2027, the global annual wind turbine installed capacity is expected to reach 139.76GW (113.24GW onshore and 26.52GW offshore). The following figure and table illustrate the share of onshore and offshore wind turbines at the global level during the study period 2018–2027:

Figure 5: Wind Turbines, Global, Onshore and Offshore (%), 2018–2027



Source: GlobalData Power Database [November 2023]

Table 4: Wind Turbines, Global, Market Volume by Installations (GW), 2018–2027

Year	Annual onshore installations (GW)	Annual offshore installations (GW)	Total annual installations (GW)
2018	45.83	4.58	50.41
2019	52.90	5.90	58.80
2020	85.91	6.12	92.02
2021	65.40	19.04	84.44
2022	68.85	8.53	77.37
2023	84.25	8.66	92.90
2024	92.59	13.79	106.38
2025	103.38	16.74	120.12
2026	110.68	21.06	131.74
2027	113.24	26.52	139.76

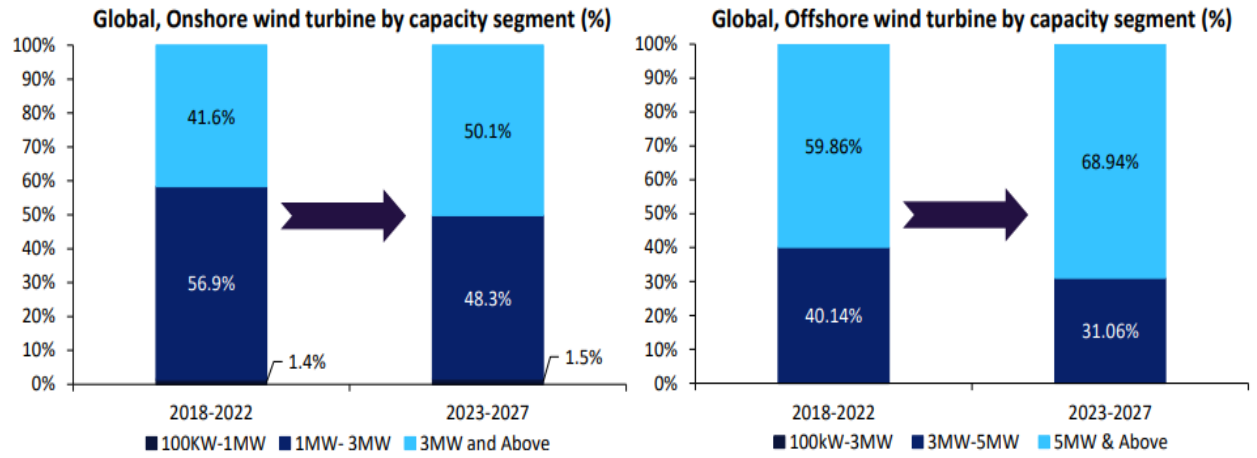
Source: GlobalData Power Database [November 2023]

Wind Turbines, Global, Onshore and Offshore Capacity by Turbine size, 2018-2027

Onshore wind turbines with a capacity of 1–3MWdominated the wind turbine installations during the historical period, accounting for 56.9% of the installations. Onshore wind turbines with a capacity of 3MW and above are expected to register an increase during the forecast period as wind developers prefer large-sized turbines. The installation of these turbines is expected to increase from 41.6% during the historical period to 50.1% during the forecast period. The share of the onshore wind turbines in the 100kW–1MWcapacity segment is expected to reach 1.5% during the forecast period.

In terms of offshore wind turbine installations, offshore wind turbines with a capacity of 5MW and above dominated the market during the historical period and this trend is expected to continue during the forecast period. Its share is expected to increase from 59.9% to 68.9% during the forecast period. The share of 3–5MW wind turbines is expected to decline from 40.1% during the historical period to 31.1% during the forecast period. There were no installations in the 100kW-3MW capacity segment, and this trend is expected to continue during the forecast period.

Figure 6: Wind Turbines, Global, Onshore and Offshore Capacity by Turbine Size (%), 2018–2022, 2023–2027



Source: GlobalData Power Database [November 2023]

Table 5: Wind Turbines, Global, Onshore and Offshore Capacity by Turbine Size (MW), 2018–2022, 2023–2027

Onshore capacity segment	Onshore capacity (2018–2022)	Onshore capacity (2023–2027)	Offshore capacity segment	Offshore volume (2018–2022)	Offshore capacity (2023–2027)
100kW-1MW	4,555.8	7,774.0	100kW-3MW	1.1	-
1-3MW	181,529.5	243,561.6	3MW-5MW	17,732.9	26,950.1
3MW and above	132,796.6	252,797.2	5MW & Above	26,440.9	59,814.5

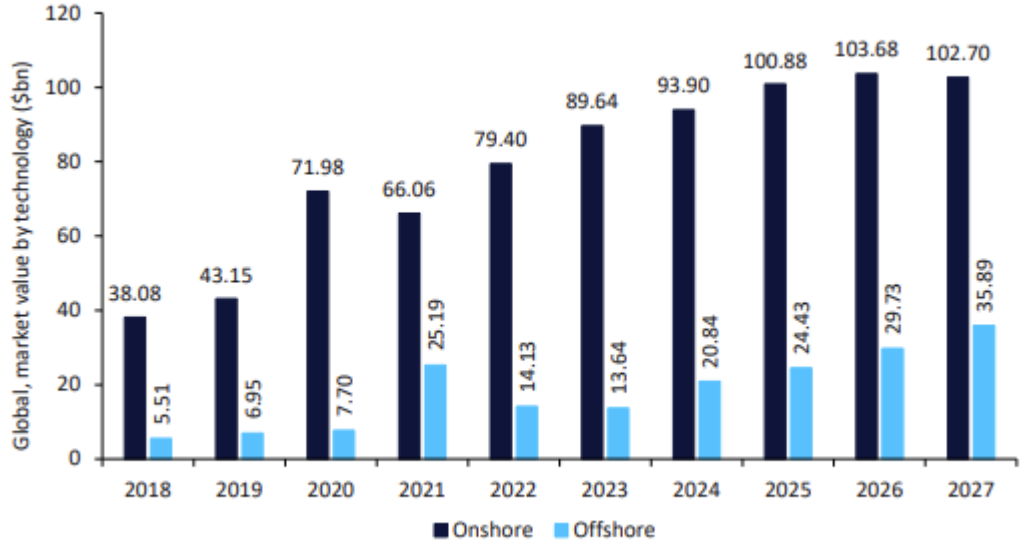
Source: GlobalData Power Database [November 2023]

Wind Turbines, Global, Market Volume by Technology, 2018–2027

The global annual wind turbine market, which stood at $43.59 billion in 2018, reached $93.53 billion in 2022. In 2022, Asia-Pacific was the frontrunner, reporting a market value of $45.91 billion. Asia-Pacific was followed by EMEA and the Americas with $26.38 billion and $21.24 billion, respectively. The global annual wind turbine market is estimated to reach $138.59 billion in 2027.

The share of offshore wind turbines in the global wind turbine market value is expected to grow considerably during the forecast period owing to the increasing preference for offshore installations in major countries. During the historical period, the aggregate value of offshore wind turbines was $59.47 billion, and the aggregate value is expected to reach $124.52 billion during the forecast period.

Figure 7: Wind Turbines, Global, Market Value by Technology ($bn), 2018–2027



Source: GlobalData Power Database [November 2023]

Table 6: Wind Turbines, Global, Market Value by Technology ($bn), 2018–2027

Year	Onshore wind turbines ($bn)	Offshore wind turbines ($bn)	Total wind turbines ($bn)
2018	38.08	5.51	43.59
2019	43.15	6.95	50.10
2020	71.98	7.70	79.67
2021	66.06	25.19	91.24
2022	79.40	14.13	93.53
2023	89.64	13.64	103.28
2024	93.90	20.84	114.74
2025	100.88	24.43	125.32
2026	103.68	29.73	133.41
2027	102.70	35.89	138.59

Source: GlobalData Power Database [November 2023]

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