

Chinese Wind Turbine Export Growth Continued in 2021

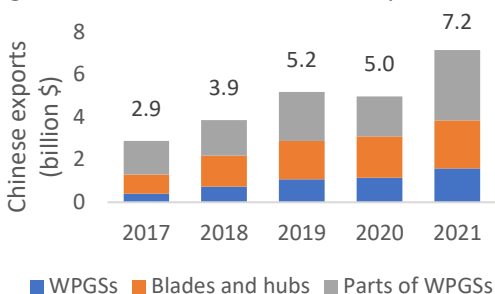
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Chinese wind turbine exports increased from \$2.9 billion in 2017 to \$7.2 billion in 2021, including a \$2.2 billion increase from 2020 to 2021.¹ The rise in exports reflects the increasing competitiveness of Chinese original equipment manufacturers (OEMs) in foreign markets, Western OEMs exporting more turbines from their factories in China, and an increase in component sourcing from China.

Rapid growth in Chinese wind turbine exports

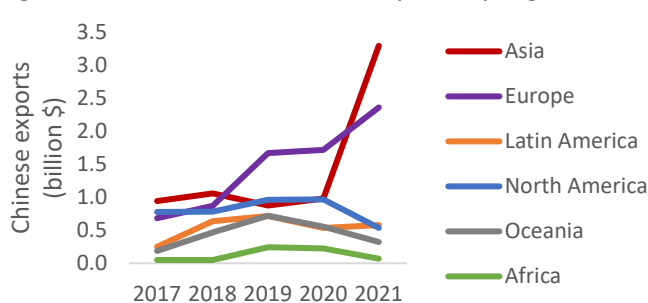
Chinese wind turbine exports increased from \$2.9 billion in 2017 to \$7.2 billion in 2021 (figure 1). Exports of wind-powered generating sets (WPGSs) increased by 294 percent, exports of blades and hubs rose by 150 percent, and exports of WPGS parts grew by 109 percent. Export growth was likely higher in volume terms due to the significant decline in wind turbine prices.² The rise in exports was primarily driven by demand in Europe and Asia, with the large increase to Asia in 2021 driven by higher demand in Vietnam (figure 2). Chinese exports to North America also rose during 2017–20 but fell in 2021 amid weaker U.S. demand and the build-up of alternative sources of supply not subject to Section 301 duties.³

Figure 1: Chinese wind turbine exports



Source: IHS Markit, [Global Trade Atlas](#).

Figure 2: Chinese wind turbine exports by region



Source: IHS Markit, [Global Trade Atlas](#).

Chinese OEMs continue to increase foreign sales

Exports by Chinese OEMs increased from 641 megawatts (MW) in 2017 to several gigawatts (GW) in 2021, with at least five OEMs exporting more than 150 MW (including at least one OEM exporting more than 1 GW). Goldwind, the largest Chinese OEM, has set a goal of 2 to 3 GW in annual exports starting in 2022.⁴ The pattern of exports by Chinese OEMs indicates the increasing competitiveness and acceptance of their products, which are typically lower priced, in foreign markets.⁵

¹ Wind turbines include components, such as nacelles (the main power generation component), blades, and hubs, that are often shipped separately. This EBOT covers Chinese exports of: (1) wind-powered generating sets (WPGSs) (8502.31.00), which are nacelles and components shipped with the nacelle; (2) parts of WPGSs (8503.00.30); and (3) other engines and motors (8412.90.90), which includes blades and hubs as well as some non-wind goods. Exports from Liaoning in 8501.64.10 (which covers GE nacelles) are included with WPGSs. Collectively, these data will be referred to as trade of “wind turbines.” Towers or other parts/materials used in manufacturing are not covered.

² Prices fell by more than 20 percent for turbines delivered during 2017–21. IHS Markit, [Global Trade Atlas](#); David, Andrew, “[U.S. Utility-Scale Wind Turbine](#),” Dec. 2021, 14; BloombergNEF, [2H 2020 Wind Turbine Price](#), Jul. 3, 2020.

³ USITC [DataWeb/Census](#); TPI, [Q2](#) and [Q3](#) 2021 Earnings Calls, 2021; GE, [Q1](#) and [Q3](#) 2021 Earnings Calls, 2021; WoodMac, “[Wind Turbine Prices](#),” Aug. 16, 2021.

⁴ Only two OEMs (Goldwind and Envision) exported more than 100 MW in 2017. Final 2021 data for Chinese OEMs are not yet available. CWEA [website](#); IHS Markit, [Global Trade Atlas](#); Trade Data Services, [Import Genius](#); Xinjiang Goldwind, [Q4](#) 2020 Earnings Call, Mar. 28, 2021; Bloomberg, “[China’s Wind](#),” Nov. 3, 2021; publicly available project information; Bloomberg, “[Wind Giants](#),” Mar. 8, 2022; BloombergNEF, “[Vestas Leaves](#),” Mar. 23, 2022.

⁵ Hinata, Yusuke, “[Global Expansion](#),” Nov. 10, 2020; Bloomberg, “[China’s Wind](#),” Nov. 3, 2021.

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The growing acceptance of Chinese OEMs' products in foreign markets is reflected, for example, in:

- **Increasing external sales:** Chinese OEMs are increasingly able to sell turbines to external customers in foreign markets, indicating greater acceptance of their turbines. However, many exports are still for projects in which other Chinese firms play a role in development, financing, and/or construction.⁶
- **Recent success in foreign offshore markets:** Chinese OEMs made significant inroads into the offshore wind market outside of China in 2021 and early 2022, with orders and/or exports to countries such as Italy, Japan, and Vietnam. Chinese OEM Mingyang also signed MoUs in Brazil and the UK that may lead to its entry into the offshore market in these countries. Chinese OEMs have typically supplied smaller offshore turbines to foreign markets than competitors, but are introducing larger models.⁷
- **Gaining sales in Europe:** Chinese OEMs historically were only able to book occasional sales in Europe, but appear to be making inroads with more than 400 MW in exports to Europe in 2020–21.⁸

Despite recent gains, Chinese OEMs' market shares outside of China remain relatively small in some regions, such as Western Europe and the United States, where their gains have been limited by factors such as track record, quality assurance, performance, and the level of service provided.⁹ However, they account for a significant share of the market in regions such as Latin America and the rest of Asia.¹⁰

Western OEMs turn to China as a nacelle export hub

The largest Western OEMs—GE, Siemens Gamesa, and Vestas—significantly increased nacelle exports from China during 2017–21 due to (1) significant available capacity at their Chinese plants due to the lack of sales in China, (2) the low cost of production, (3) the size and maturity of the local component supply chain, (4) a better match between the products manufactured in China and foreign demand, and (5) the diversification of global demand. U.S. and European OEMs now collectively serve all regions from their plants in China, though the geographic scope of exports varies by firm. Siemens Gamesa produced 2.3 GW in China in their 2020 fiscal year, a majority of which went to foreign markets. In 2021, Siemens Gamesa announced that it would stop Chinese sales of wind turbines, and that its China plant would only supply foreign markets. GE's exports from China likely totaled about 0.5 to 1 GW in 2021, with exports to Africa, Asia, Australia, and Europe. Vestas similarly exports to multiple regions from China.¹¹

China is a major source of other components and parts

The increased exports by Chinese OEMs (which have a heavily China-based supply chain), the shift over the last decade by U.S. and European OEMs to sourcing more components from China to reduce costs, and the diversification of demand have contributed to the increase in component exports by Chinese and foreign suppliers with plants in China. Western OEMs continue to source large volumes from China to meet global demand despite some recent efforts to reduce their dependence on China in order to benefit from cost advantages in other countries and mitigate the impact of U.S. Section 301 tariffs.¹²

⁶ David, Andrew, "[China Emerges as a Major Exporter](#)," Mar. 2021; Goldwind, "[2020 Annual Results](#)," Mar. 28, 2021, 13; Goldwind, "[2017 Annual Results](#)," Mar. 25, 2018, 15; publicly available project information.

⁷ Agyepong-Parsons, James, "[MingYang Enters European](#)," Jan. 25, 2021; Lee, Andrew, "[MingYang in Japan](#)," Jan. 4, 2022; Radowitz, Bernd, "[MingYang Wins Order](#)," Oct. 25, 2021; Zhang, Cuimei, "[DEW Got the First](#)," Feb. 5, 2021; Durakovic, Adnan, "[Goldwind Goes](#)," Jun. 25, 2021; Collins, Leigh, "[UK Agrees](#)," Dec. 17, 2021; Yu, Yuki, "[Ming Yang Sizes Up](#)," Sep. 22, 2020; Bloomberg, "[China's Wind](#)," Nov. 3, 2021; Lee, Andrew, "[Goldwind Unveils](#)," Nov. 1, 2021.

⁸ IHS Markit, [Global Trade Atlas](#); Trade Data Services, [Import Genius](#); publicly available project information.

⁹ Bloomberg, "[China's Wind](#)," Nov. 3, 2021; Radowitz, Bernd, "[Siemens Gamesa](#)," Nov. 24, 2021; Vestas, [Capital Markets Day](#), Dec. 15, 2021.

¹⁰ IHS Markit, [Global Trade Atlas](#); Trade Data Services, [Import Genius](#); publicly available project information.

¹¹ Radowitz, Bernd, "[Giant China](#)," Mar. 25, 2021; Lee, Andrew, "[Siemens Gamesa](#)," Aug. 27, 2021; David, Andrew, "[China Emerges](#)," Mar. 2021; IHS Markit, [Global Trade Atlas](#); Trade Data Services, [Import Genius](#); project information.

¹² David, Andrew, "[The Evolution of Global](#)," May 2021; TPI, [Q4 2020](#) and [Q3 2021 Earnings Calls](#), 2021; WoodMac, "[Wind Turbine Prices](#)," Aug. 16, 2021; IHS Markit, [Global Trade Atlas](#); Vestas, [Capital Markets Day](#), Dec. 15, 2021.