China's Drive for Economic Growth Fuels the FACTS Market

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- China, in pursuit of its economic objectives, has been persistently increasing generation capacity.
- A significant proportion of demand for FACTS in China is driven by renewables.
- The STATCOMs market is expected to grow in tandem with the integration of renewables with the grid and has recently become the most preferred technology.

China, in pursuit of its economic objectives, has been persistently increasing generation capacity (conventional and renewable) over the years and, consequently, the transmission infrastructure to evacuate power. The increasing share of renewables, however, gave rise to issues concerning the reliability and stability of the grid. In response, system operators have relied on FACTS devices, specifically STATCOMs and SVCs, to maintain the reliability and stability of the power system with a significant share of intermittent energy resources. These developments have driven the FACTS market of China over the years, especially the market for STATCOMs in recent years.

Key Chinese Regions Fostered the FACTS Market

In the last decade, China has focused heavily on the development of HVAC and HVDC transmission expansion to transmit hydel power from Yunnan, Guizhou, and the Three Gorges (collectively called Pearl River Delta Region) to load centers in Guangdong. This resulted in the deployment of STATCOM and SVC to ensure grid stability and controllability. Based on the target set in the13th FYP development plan for renewable energy, China expanded its

onshore wind power generation by nearly 70 GW in the regions of Jiangsu, Henan, Hubei, Hunan, Sichuan, Guizhou, and other provinces. In addition, nearly 135 GW of large-scale wind power setups were installed in the Three-North region. In terms of offshore developments, China installed more than 5 GW of offshore wind.

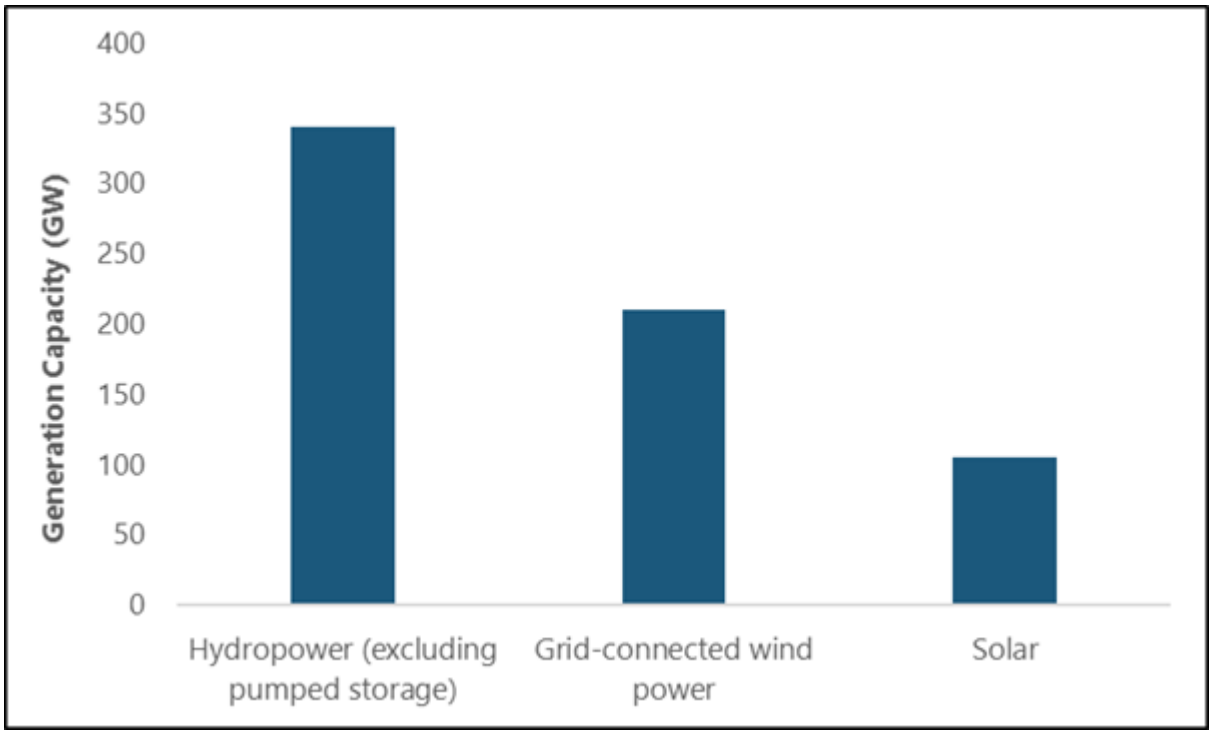

Figure 1: Renewables expansion in accordance with 13th FYP development plan for renewable energy (2016-2020).
Source: Power Technology Research

Chinese FACTS Market Outlook

The Chinese FACTS market is projected to grow with a CAGR of 2% from 2022 to 2026. This projection is in line with the plans of the Chinese government to install 1200 GW of solar and wind generation capacity by 2030.

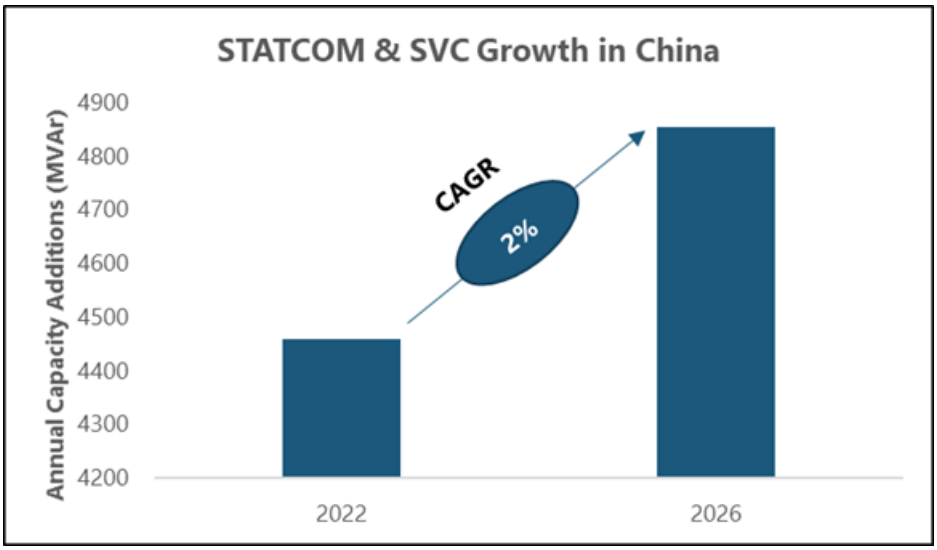

Figure 2: Growth of STATCOMs and SVCs in China from 2022-2026.
Source: Power Technology Research

Until 2000, the Chinese FACTS market was clearly dominated by SVCs, which were mostly deployed to support expansion in the grid infrastructure whilst maintaining grid stability. The dominance of SVCs over STATCOM remained unchallenged during the 2000s, as well; however, China became one of the first four countries in the world to deploy the first commercial utility scale STATCOM in the early 2000s, at the Gansu Cheng bi substation. From 2011 to 2021, the Chinese FACTS market undertook a drastic transition, in terms of technology preference, from SVCs to STATCOMs. STATCOMs gained traction in the region with the increase in the integration of renewables with the grid in the last decade and ongoing transmission expansions in the Chinese power network.

It is significant to note that China increased its renewable generation in line with the targets set in the 12th and 13th Five Year Plan for the development of renewable energy. Furthermore, the existence of stringent reactive power compensation requirements in China for renewables make it mandatory for wind and solar farms to have STATCOMs installed, effectively driving the STATCOM market in the last decade.

In order to provide reactive power support for medium voltage renewable applications, the static reactive power generator is mostly deployed in the country. This has an edge over STATCOMs for high voltage applications because it can both inject and absorb the reactive power necessary to ensure grid stability.

Application Trend in FACTS Market of China

A significant proportion of demand for the FACTS market in China is driven by renewables. The rapid increase in the deployment of renewable energy capacity in the last five years, followed by strict grid regulations ensured that more than 50% of the FACTS deployed in China were in the renewables sector, and the majority of deployments were STATCOMs. Another reason for the exponential growth in the FACTS market is the presence of competitive local players providing the technology at relatively cheap rates. Moreover, the expansion of the transmission infrastructure and installation of electric arc furnaces in the steel industry have also boosted the Chinese FACTS market. The subway electrification also added to the demand of FACTS in China.

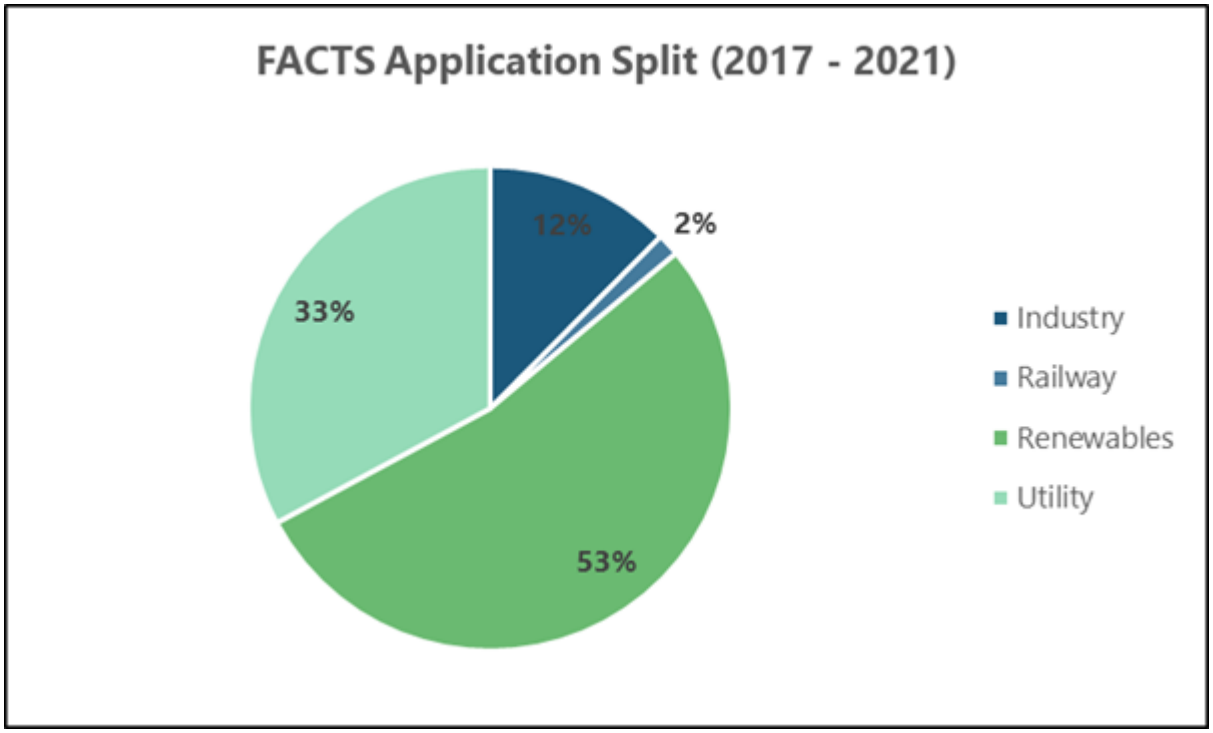

Figure 3: FACTS application split from 2017-2021.
Source: Power Technology Research

Looking Ahead

The Chinese FACTS market is one of the major FACTS markets in the world. In recent years, the FACTS technology has gained significant traction in the country owing to its electricity grid infrastructure expansion projects and the integration of renewables with the grid, which require additional support to maintain grid stability. The STATCOMs market is expected to grow in tandem with the integration of renewables with the grid and has recently become the most preferred technology, due to its efficiency and compatibility as compared to SVCs. However, the SVCs market still exists in China, as the technology is used to carry out the end of lifecycle replacements of the existing SVC footprint, and is also employed in the industrial sector, where there are no space constraints.

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