JinkoSolar Intellectual Property White Paper

2024.07

JinkoSolar Intellectual Property Milestones

- August 2018, Selected as National Intellectual Property Demonstration Enterprise.
- August 2019, Established Intellectual Property Management Department.
- May 2020, the number of patent applications reaches 1,000.
- April 2021, 1,000 patents granted July 2022, 2,000 patents filed.
- October 2022, ranked 38th in the invention patent list of private enterprises in 2022.
- July 2023, the number of patent applications reached 3,000 pieces.
- August 2023, won the Jiangxi Provincial Patent Award.
- August 2023, awarded Zhejiang Province Intellectual Property Award.
- November 2023, awarded 2023 Green Technology Innovation Typical Case.
- November 2023, awarded Zhejiang Province Intellectual Property Demonstration Enterprise.
- November 2023, the number of patent applications was 3500, and the number of patent authorizations reached 2000.
- December 2023, elected as the vice director of China PV Industry Association Intellectual Property Professional Committee.

Preface

Established 18 years ago, Jinko Solar is dedicated to innovating photovoltaic manufacturing for a sustainable energy future. Their mission is to provide clean, safe, and economical energy globally, with a focus on making solar energy the primary source. Innovation propels Jinko Solar, evident in their breakthrough patents, technology advancements, and the promotion of industrialization. They actively drive technological innovation, support rapid business development, and lead industry upgrades through an open-source platform.

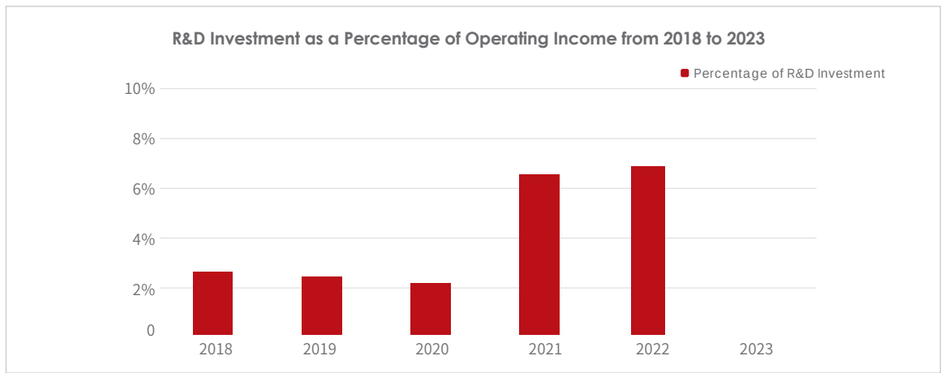
As the world's largest photovoltaic module manufacturer, Jinko Solar excels in patent applications, authorizations, and quality. These patents enhance product competitiveness, expedite the industrialization of new technologies, and foster international cooperation. Jinko Solar actively fosters an industrial intellectual property ecosystem, sharing patent technology through diverse cooperation models for collaborative innovation.

Guided by the values of "innovation, application, respect, cooperation," Jinko Solar's intellectual property strategy contributes significantly to the sustained high-quality development of the company.

Industry-Leading Technological Innovation and Application

1.1 Leading R&D Investment, Global First in TOPCon and Other Leading Technologies

Jinko Solar, a technology-driven enterprise, consistently increases R&D investment, reaching 6%-7% of revenue since 2021. With a total investment of 9 billion yuan from 2020 to 2022, their R&D intensity ranks among the top in the photovoltaic industry. Jinko Solar holds the world record for photovoltaic product efficiency, breaking it 26 times. Recognized by MIT's "MIT Technology Review," the company is listed among the top 100 smartest global companies.

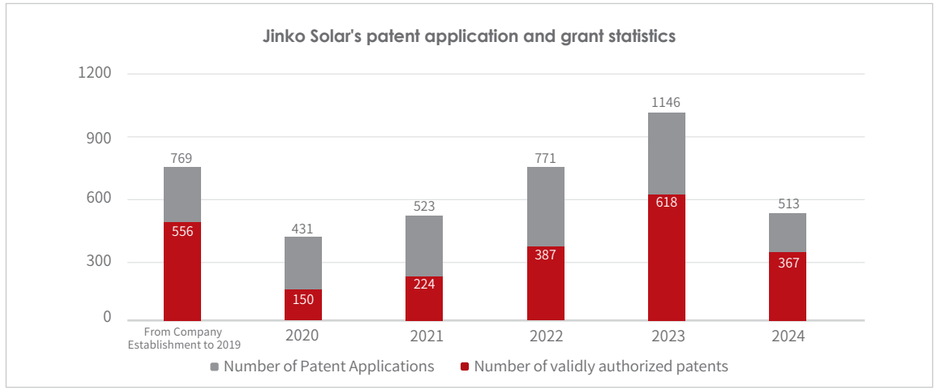


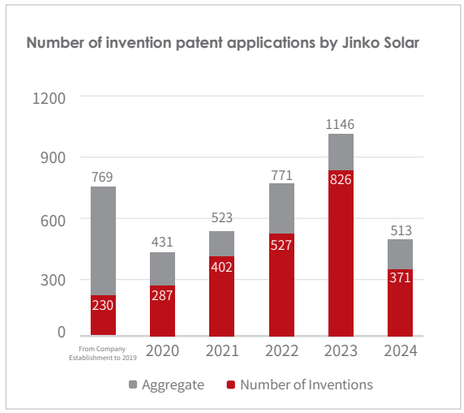
Jinko Solar, a leading technology-driven energy company, advances new technology adoption and independent innovation. Through an open-source R&D platform, it lowers barriers for industrial application, making photovoltaic technology accessible to all on a fair and inclusive basis.

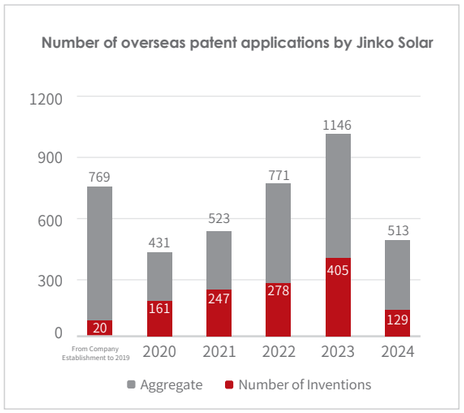
1.2 Globally Leading Patent Layout in Core Technologies

Jinko Solar, breaking the solar cell efficiency record 26 times and leading global module sales five times, surpasses 100GW and 200GW in cumulative shipments. Sustained leadership is driven by patented technologies, boosting competitiveness and vitality in ongoing development.

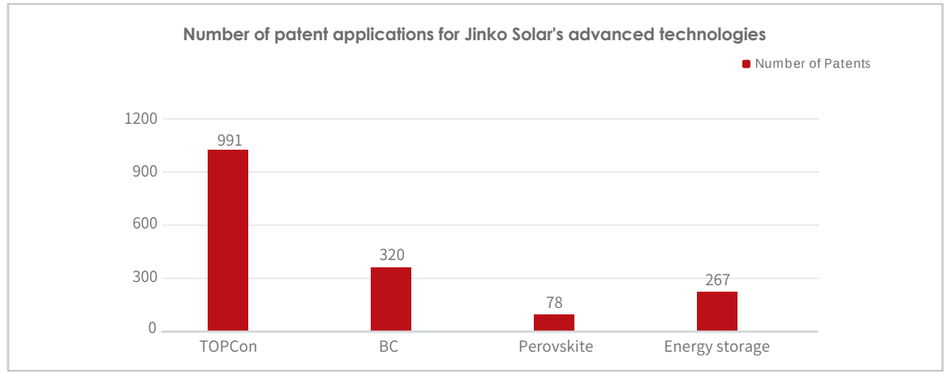
They boast over 4100 global patent applications and 2100 patent grants, making them a leading company in the photovoltaic industry. Jinko Solar's patent applications and grants represent 55.6% of the total, with invention patent applications making up 63.6%. Notably, the company holds 467 granted patents for N-type TOPCon technology, the highest in the industry.



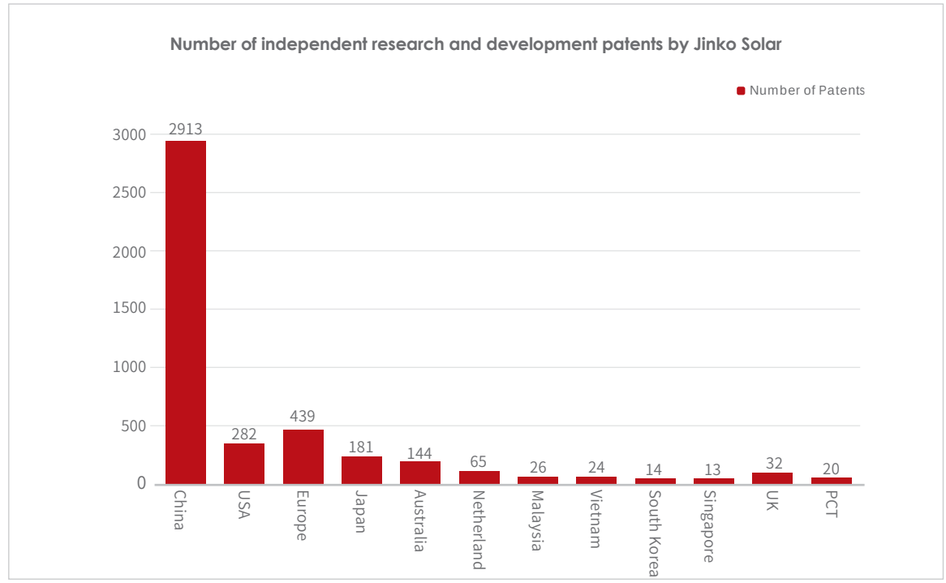




Leading globally in patent layout for advanced technologies such as TOPCon, BC, perovskite in the fields of solar cells and modules, as well as energy storage.



Jinko Solar not only continues patent layout in China but also in major countries and regions such as the United States, Europe, South Korea, and Japan. The company's global invention patent applications lead the industry, with 40% of overseas patent applications. Additionally, Jinko Solar is one of the companies with the highest number of authorized patents in China.



*BC is Back Contact， PCS is Power Conversion System

High-Value Patents Globally Leading, Consolidating Industry Leadership Position

Jinko Solar not only holds a substantial number of patents but also leads in creating high-value patents. It is ranked first globally in the solar industry on IPR Daily's Global Patent Value Rankings, considering dimensions like creativity, protection, application, competitiveness, and influence. This positions Jinko Solar favorably in the global market's industry and value chain competition.

IPR Daily Global Solar Cell Patent Rankings

Applicant Companies	Number of Patents
LG	1360
Jinko Solar	1101
Aiko Solar	931
Canadian Solar	759
Panasonic	735
Samsung	719
LONGi	708
SONY	708
KANEKA CORPORATION	707
CEA	705
Chinese Academy of Sciences	693
MAXEON SOLAR	573
TOSHIBA	499
SunPower Corporation	484
Mitsubishi	473

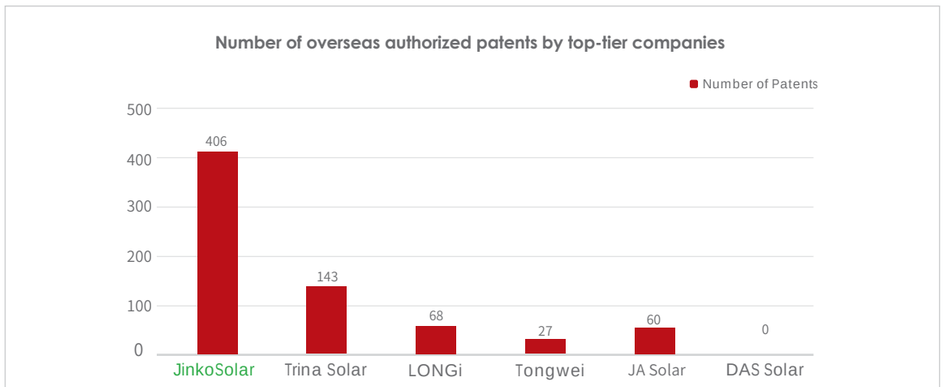
*2022 JinkoSolar has purchased the LG Group PV patent package.

Jinko Solar's photovoltaic innovation arises from exploring cutting-edge foundational technologies, merging R&D with industrial implementation, and providing iterative solutions to real-world challenges in large-scale applications. Emphasizing high-value patents, Jinko Solar transforms innovative achievements into widely applied patents, driving the high-quality development of the industry. The majority of these photovoltaic patents are integrated into Jinko Solar's products, services, and those of its partners.

Number of invention patent applications by top-tier companies

Applicant Companies	Number of Patents
JinkoSolar	2437
Trina Solar	2360
LONGi	2043
Tongwei	1076
JA Solar	944
DAS Solar	208

*Data source: Wisdom Sprout Patent Database, retrieval date: July 25, 2024



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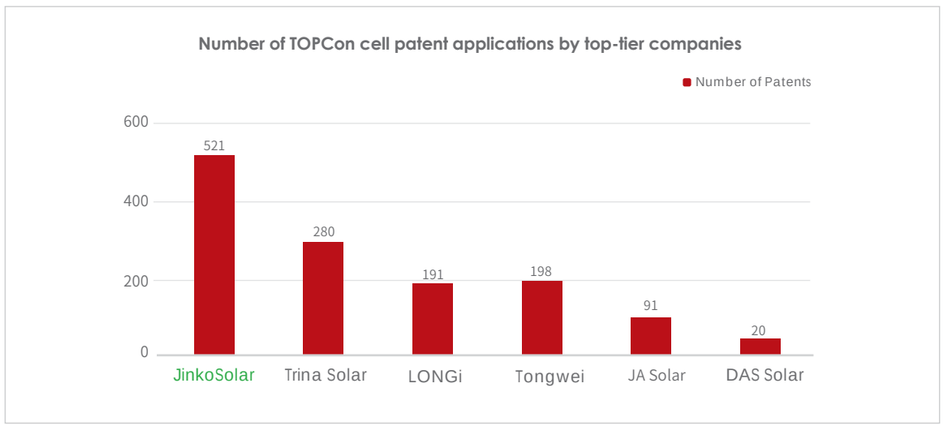

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Building an Intellectual Property Ecosystem

As an innovative entity, Jinko Solar, through the transformation and application of patents, better promotes the technological flow and collaborative innovation among diverse entities in the industrial ecosystem. This process effectively transforms patents into tangible productivity and capital strength.

3.1 Open Platform & IP Ecosystem

Jinko Solar's TOPCon tech is rapidly adopted, spurring demand from enterprises. With a vast reservoir of TOPCon patents, the company builds a knowledge property ecosystem, accelerating industry application.

3.2 IP Operation Center

In 2019, Jinko Solar prioritized TOPCon, Bc, perovskite, and energy storage, establishing the IP Operation Center. Focused on patent planning, application, protection, and anti-infringement, it drives collaboration, ensuring supply chain security, and advancing the industry's global value chain.

3.3 Technology Output, Partner Empowerment

Using TOPCon, Jinko Solar licenses patents to a top global PV company, driving industrialization, promoting innovation, reducing partner R&D costs, and enhancing overall efficiency.

Summary

Jinko Solar, a powerhouse in new energy with robust R&D capabilities, pioneers critical core technologies, ensuring clean, fair, safe, and intelligent photovoltaic energy is accessible to all. Guided by its mission, Jinko leverages strategically positioned advanced technology patents and an industrial IP ecosystem to turn patents into tangible productivity. This propels the conversion and application of high-value patents, empowering industry partners.

Jinko Solar leads the photovoltaic industry towards high-quality development, emphasizing technology's true value by focusing on, respecting, and revering technology.