



Johannes Bernreuter

The Polysilicon Market Outlook 2029

Technologies · Capacities · Supply · Demand · Prices



Your Polysilicon Market Guide

Despite strongly growing demand from the solar sector, overcapacity and large inventories are currently dominating the polysilicon industry. Would you like to be up to date on the decisive market trends, the latest technological developments and future price points? *The Polysilicon Market Outlook 2029* provides you with all of that. The 102-page report analyzes hundreds of data and details, presents them in a clear and compact form and draws insightful conclusions to help you navigate in a volatile market.

- ▶ The **introduction** describes why the polysilicon industry is like a super tanker with a long brake path, how the increasing Chinese share in production has changed this behavior, and why the pork cycle from oversupply to shortage to oversupply has returned after a long break.
- ▶ The **background** chapter explains why monocrystalline solar cells and modules were able to replace the once dominant multicrystalline technology within just five years and how almost the same is now happening between p-type and high-efficiency n-type cells.
- ▶ The **technology** chapter analyzes why the prevalent Siemens process has remained unchallenged and how much progress fluidized bed reactor (FBR) technology has made for producing polysilicon granules. In addition, the chapter looks at which activities have been undertaken to upgrade silicon kerf loss from wafer sawing using metallurgical processes.
- ▶ The **capacity** chapter lists 66 polysilicon supply contracts and screens the construction projects of 36 new Chinese and three new Indian entrants and aspirants. A comprehensive table provides a concise overview of all plant shutdowns, capacity expansions and greenfield projects implemented and planned between 2021 and 2029. The chapter concludes with three trends that are shaping the global polysilicon industry today.
- ▶ The **supply** chapter presents four different scenarios of production volumes and end-of-year capacities for 41 polysilicon plants from 2023 through 2029. It highlights the market shares of the top ten manufacturers, points out China's dominance among the world's polysilicon production regions, and analyzes which impact the overcapacity in China has had so far. Finally, it details the production volumes of electronic-grade polysilicon for each manufacturer and shows impurity specifications and measurement data for electronic grade.
- ▶ The demand chapter quantifies the polysilicon demand of the semiconductor and photovoltaic (PV) industries from 2019 through 2029. It analyzes the downside bias of traditional PV forecast models and shows a noval approach to predicting global PV installations. Moreover, the chapter provides a wealth of data on market shares of various solar cell technologies, cell efficiencies, wafer thickness and kerf loss, which all influence the specific silicon consumption.
- ▶ The **balance** chapter reconstructs the supply/demand balance for electronic-grade polysilicon since 2009, compares the various demand scenarios with supply on the total polysilicon market through 2029, and takes a special look at how close the market-clearing scenario (no oversupply) came to actual PV installations in the past. In conclusion, the chapter explains how the polysilicon overcapacity could be dissolved in the coming years.
- ➤ The duty chapter provides background on the anti-dumping measures of the Chinese Ministry of Commerce and shows data from customs statistics on polysilicon imports into China from 2013 through 2024 and into Vietnam, Malaysia and Thailand from 2017 through 2024.
- ▶ The chapter on the U.S. **import ban** against products made with forced labor in the Xinjiang Uyghur Autonomous Region in northwestern China elucidates the coercive nature of labor transfer programs in Xinjiang and reveals who the main silicon metal suppliers of seven leading polysilicon manufacturers in China are. The chapter also quantifies the share of Xinjiang-based plants in the global output of solar-grade polysilicon.
- ▶ The **price** chapter examines the factors that have influenced the polysilicon spot price since 2021. Based on an analysis of Chinese industry cost curves, the chapter forecasts how the spot price will develop in China through 2029. For non-Chinese polysilicon, an alternative analysis explains how the price is formed outside China.
- ▶ The **outlook** chapter uses new data to assess the global quartz reserves for silicon metal production and predicts how much of these reserves will be consumed by polysilicon, silicones, aluminum-silicon alloys and silicon-based anodes for lithium-ion batteries by 2030.

Content Highlights

The Chinese polysilicon industry will face a difficult balancing act in the next three years. If too much overcapacity is eliminated, the market could run into a new shortage by 2028.

Fueled by the shortage that culminated in a price peak of US\$39/kg in 2022, the Chinese polysilicon industry expanded its production capacity massively to approx. 3.25 million metric tons (MT) by the end of 2024. In the same year, it reached a share of 93.5% in the global output (even 95% in solar-grade polysilicon).

Two thirds of the new capacity has been built by the top four Chinese manufacturers alone. Notably, market leader Tongwei tried to gain additional market share at the cost of weaker competitors. However, Tongwei's cut-throat strategy has not panned out so far as most new entrants are backed by parent corporations with deep pockets.

As a result, polysilicon inventories piled up to a volume of 400,000 MT by the end of 2024. The market price in China has undercut US\$4.50/kg and has thus fallen below the cash costs of most manufacturers; consequently, they are suffering from sustained losses.

Although 33 leading Chinese polysilicon and solar companies agreed in December 2024 to cut output, the extent of the reduction has not been sufficient to carry off the high mountain of inventory. Polysilicon prices in China will hardly rise beyond US\$5/kg through 2027 unless manufacturers shorten supply more drastically or the price of silicon metal feedstock rebounds strongly.

However, Bernreuter Research warns that the complete elimination of excess production capacity could backfire. A major industry shakeout will lay the ground for a new shortage by 2028 – which is exactly what happened during the shakeout from 2018 through 2020.

Bernreuter Research remains optimistic about demand from the solar sector, the polysilicon industry's largest customer. We have reduced our forecast for global PV installations in 2025 from 750 to 720 gigawatts-direct current (GW_{DC}) since the current demand weakened after China introduced a new, market-based remuneration system for distributed PV plants with a capacity of up to 20 megawatts; however, the strong Chinese last-minute rally in May still makes 750 GW_{DC} possible. Bernreuter Research is sticking to its novel forecast approach, which stood the reality test in 2023 and 2024, and projects annual PV installations of 1,900 GW_{DC} in 2029.

With sophisticated scenarios of supply and demand in and outside China, detailed forecasts of polysilicon prices through 2029, the latest cash cost data on the dominant Siemens process and fluidized bed reactor technology, as well as many other market trends, the *Polysilicon Market Outlook 2029* provides comprehensive, in-depth and up-to-date information on the global polysilicon, solar and semiconductor markets.



Johannes Bernreuter

About the author

Johannes Bernreuter, 59, is head of the polysilicon market research specialist Bernreuter Research. Before founding the company in 2008, Bernreuter became one of the most reputable photovoltaic journalists in Germany because of his diligent research, clear style and unbiased approach. He has earned several awards, among others the prestigious RWTH Prize for Scientific Journalism from the RWTH Aachen University, one of the eleven elite universities in Germany. Originally an associate editor at the monthly photovoltaic magazine Photon, Bernreuter authored his first analysis of an upcoming polysilicon bottleneck and alternative production processes as early as 2001. After preparing two global polysilicon market surveys for Sun & Wind Energy magazine in 2005 and 2006, he founded Bernreuter Research to publish in-depth polysilicon market reports.

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Companies covered

SUMCO/Mitsubishi Materials

USA

China Tongwei

Hemlock Semiconductor GCL Technology

Wacker Polysilicon North America Jiangsu Xinhua Semiconductor (GCL)

REC Silicon Dago New Energy

High-Purity Silicon America Xinte Energy (TBEA)

Highland Materials East Hope

Germany Asia Silicon (Hongshi Holdings)

Wacker Chemie Xinjiang Goens

Shaanxi Non-ferrous Tianhong REC

Inner Mongolia Erdos Polysilicon Japan

Tokuyama Inner Mongolia Dongli PV

Yichang CSG Silicon Materials

South Korea Qinghai Huanghe Hydropower

OCI Company Luoyang China Silicon

New entrants:

Malysia Ningxia Runyang Silicon Material Tech. OCI TerraSus

Xinjiang Jingnuo New Energy Industry

Bayannur Juguang Silicon Industry

Hongyuan Energy Technology

Qinghai Lihao Qingneng

Oman Hoshine Silicon Industry

United Solar Polyilicon Xinjiang Qiya Silicon Industry

Gansu Guazhou Baofeng Silicon Material

India Xinyi Silicon Industry

Reliance New Energy Solar Haidong Hongshi Semiconductor

Indosol Solar (Shirdi Sai Electricals) Qinghai CSG Sunrise New Energy Tech.

Mundra Solar PV (Adani Solar) and many more aspirants

Manufacturers of upgraded silicon kerf

REC Solar Norway (formerly Elkem Solar) Hunan Lixin Silicon Material Technology Geely Juneng (Zhejiang) Technology

What Customers Said about the Polysilicon Market Outlook 2027

"Invaluable report and well worth the investment"

Bernreuter Research does an outstanding job of presenting the polysilicon market in great detail and explaining the market conditions affecting it. The Polysilicon Market Outlook 2027 gives detailed history as well as projections on how the market is expected to respond to the supply and demand variables in play. It also provides information on the various companies comprising the market. The report is invaluable and well worth the investment.



Douglas S. Tinnel, Director, Supply Chain at Silfex - A Lam Research Company 🗷

"Incredibly enlightening and thorough"

I recently purchased the Polysilicon Market Outlook 2027 from Bernreuter Research, and I must say, it exceeded my expectations. As an academic deeply involved in researching markets, I found the insights provided on the polysilicon market to be incredibly enlightening and thorough. The report is detailed, well-structured, and presented in a way that is both accessible and informative. It has significantly contributed to my understanding and research work. I highly recommend Bernreuter Research to anyone looking for in-depth analysis and data on the polysilicon industry.



Mehrshad Motahari, Chief Financial Officer of Green Ferro Alloy (FZC) LLC 년

"Easy to read, packed with detail and far more worth than the price tag"

As a retail investor I was at first hesitant to pay the price for a market report, but after reading the available material at the Bernreuter Research homepage I decided to pull the trigger. The Polysilicon Market Outlook 2027 arrived two days later, and I was instantly impressed with it. Not only is it written in a both pedagogical and informative style, it is packed with detail of technical and economic nature, for both the manufacturing and market perspective. The historic walk-through coupled with future projections of the market with transparency in its methods presents an easy-to-read logical path and builds up your understanding step-by-step. From having little experience in the industry, I now have a solid understanding from which to continue my research.

Even if I were able to have gathered this information myself, which I believe would be practically impossible, the amount of hours required for such a task makes the cost of this report a bargain. The knowledge it contains – if you are in a position where decisions have an economic impact – is worth far more than the price tag. It also helps that Johannes is a stand-up guy who was happy to answer some questions over the phone. Ten out of ten, would buy again.

Carl-Arvid Ewerbring, Retail Investor

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The Polysilicon Market Outlook 2029

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Overview of the report

The polysilicon industry in China has reached a global market share of 93.5%, but it is currently plagued by overcapacity, large inventories. prices below cash costs and sustained losses. How can the industry get out of this dilemma? Why would a major shakeout lay the ground for a new shortage by 2028? How will the spot price develop through 2029? What are the prospects for the separate non-Chinese polysilicon market segment? Which polysilicon manufacturers do source silicon metal from the Xinjiang Uyghur autonomous region in northwestern China, which is known for the use of forced labor? How long will the global quartz reserves last for the production of silicon metal feedstock?

These and many other questions are answered by *The Polysilicon Market Outlook 2029*. If you would like to be up to date on the decisive **market trends**, the latest **technological developments** and future **price points**, the **102-page** report provides you with all of that. It analyzes hundreds of data and details, presents them in a clear and compact form, and draws **insightful conclusions** to help you navigate in a volatile market.

For more details, please go to:

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