

# Polysilicon prices collapse amid global supply glut

**Trade action gone wrong:** China closing a loophole on polysilicon imports may have had unintended consequences, as new Chinese plants are exacerbating existing oversupply.

Spot prices for polysilicon appear to have hit a new low, falling to under \$15 per kilogram for the first time in over a decade this November. This is the result of a global oversupply years in the making, with more and more polysilicon facilities debottlenecking and new ones coming online.

Bloomberg reported this startling price on November 13; however what has been less obvious to casual observers is the role Chinese trade action and China's polysilicon industry have played in this overcapacity and resulting crash in prices.

## More casualties of the trade war

The large majority of global wafer capacity is in China, and as such the nation is the world's largest polysilicon end-market. China had been warning that it would impose tariffs on Western polysilicon since the first U.S. trade case on Chinese PV in 2012, and made good on that promise by slapping import duties on American and EU polysilicon.

For years these duties were really only on paper, as Chinese wafer and cell makers were able to make wide use of a loophole that allowed the import of high-quality Western polysilicon duty-free if it was used for products destined for export.

In August 2014 this changed, and the Chinese government announced that the "processing loophole" would close as of September 1, 2014. This deadline was extended multiple times, and only appears to have come into effect in September 2015.

According to Johannes Bernreuter, head of Bernreuter Research, the pending closure of the processing loophole gave a signal to Chinese polysilicon makers. "My impression is that several Chinese polysilicon makers anticipated this change by expanding their capacity to get economies of scale and reduce their manufacturing costs this way, but this has exacerbated the problem of oversupply," Bernreuter told **pv magazine**.

The capacity being put online by Chinese polysilicon makers is truly awesome. One site alone, GCL's Jiangsu Zhongneng facilities, produced 19,000 metric tons of polysilicon in the third quarter of 2015. This means an annual production capacity of 76,000 metric tons, more than the total production capacity of most polysilicon makers at multiple sites.

Xinte Energy (formerly TBEA) has also been continuously either debottlenecking or expanding their capacities, and Bernreuter estimates that the company's real production capacity is above 20,000 metric tons annually, far more than the company's stated nominal capacity of 15,000 metric tons.

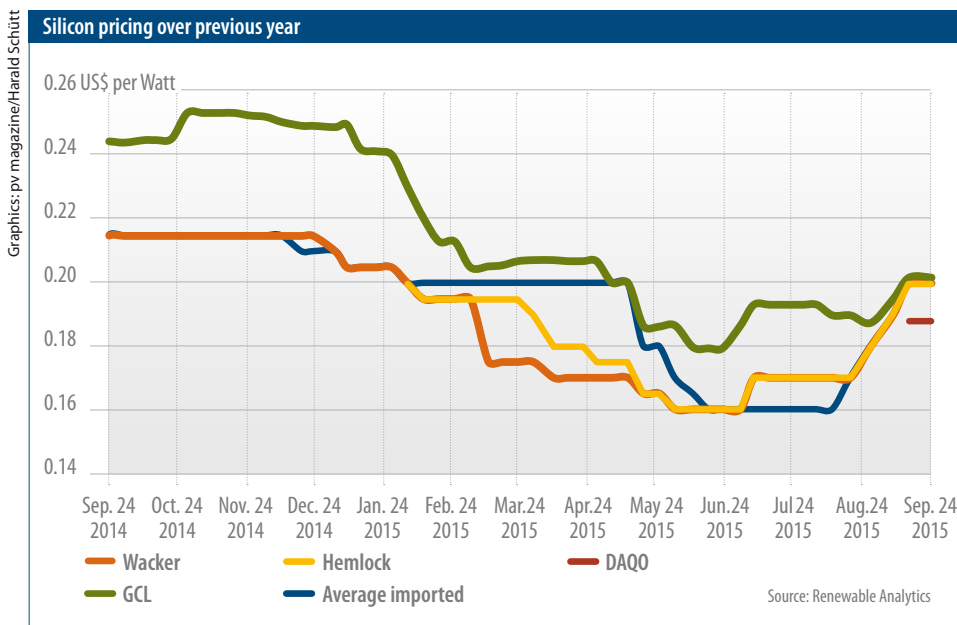
## Persistent loopholes

Additionally, while the loophole was closed for most Western polysilicon makers, import duties on South Korean polysilicon makers including OCI are very low, and Wacker Chemie has avoided import duties for its German production altogether by unilaterally negotiating a minimum import price agreement with the Chinese government.

The result is that the share of imported polysilicon to the Chinese market has not substantially decreased, but only shifted. South Korean polysilicon now represents nearly half of the import market, taking share from U.S. production.

Hemlock Semiconductor, REC Silicon and other producers that were effectively shut out of the Chinese market are now attempting to sell their product globally. This has flooded the market and further depressed prices, with the impacts seen even in China.

Bernreuter reports a price gap between Chinese and Western polysilicon, which rose as high as \$1.50 per kilogram in anticipation of the closing of the loophole. These prices have since come down



due to the impact of continued imports. Quality remains a factor, and the oversupply situation appears to have less of an impact on producers of higher-quality polysilicon such as Wacker and OCI, which typically sell under long-term contracts at higher prices.

“The original impression of Chinese manufacturers that closing the loophole would create a better world for them has not worked out,” notes Bernreuter. “One point on quality is also why Chinese customers are still demanding polysilicon from non-Chinese suppliers.”

### A train wreck of oversupply

A trait that the polysilicon industry shares with solar PV manufacturing is the long time that it takes to plan, build and ramp facilities. This makes it impossible to react to recent market information.

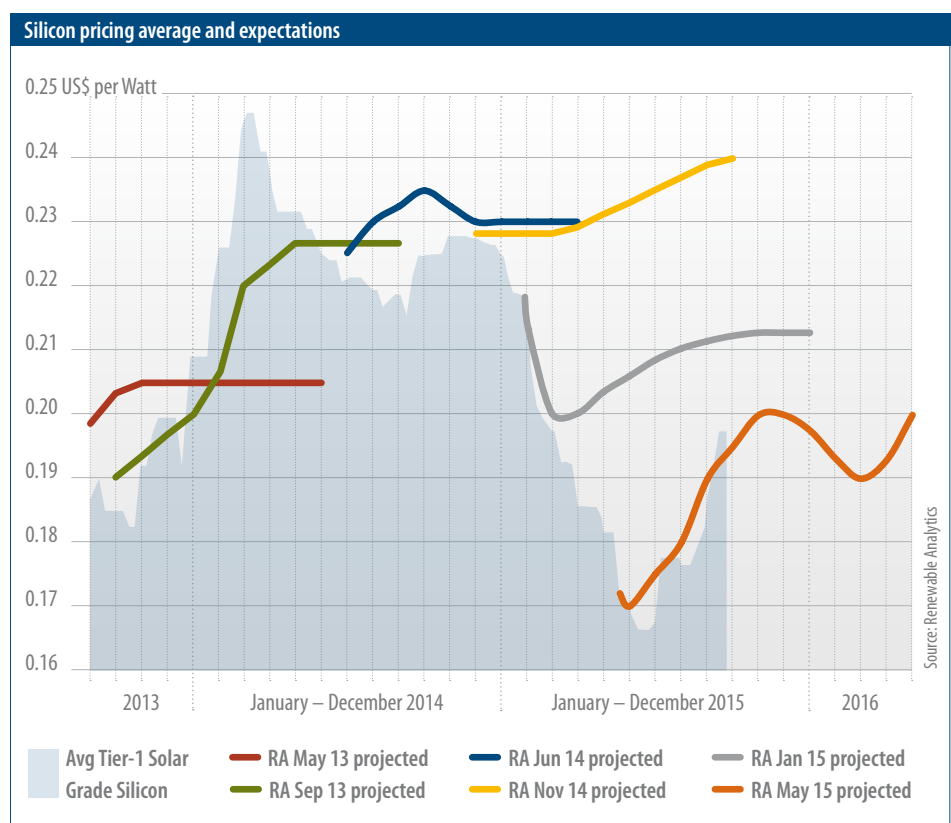
“The overarching issue is that the capacities that were planned years ago are now coming on-stream and are still creating overcapacity,” explains Bernreuter.

According to Bernreuter the global polysilicon industry was already suffering from 43,000 metric tons of oversupply in 2014. “I still see overproduction this year, so the inventory is still rising to unprecedented levels.”

These problems are further impacted by global under-investment in wafer production, which means that end-market supply of crystalline silicon PV modules and polysilicon sales are both becoming limited by wafer capacities. Bernreuter notes this is a recent problem, whereas the problem of overcapacity has been existing since early 2014.

### No end in sight

According to PV Insights, spot prices fell to \$14.10 per kilogram in the second week of November, and the company predicts



that the spot price will fall below \$14.00 this year.

If prices fall too low, Bernreuter says that some polysilicon makers will have to curtail production. Given the very high fixed costs of polysilicon facilities, this is a painful decision for producers.

“The economic impact is obvious: You have a lower volume over which you can spread your fixed costs,” explains Bernreuter. “Your cost per kilogram will go up.”

The Q3 results of polysilicon makers are showing mixed results. Wacker Chemie reported increased sales volumes and healthy margins. GCL likewise reported an increase in shipments, but did not offer financial data, except to note a fall in average selling prices during the quar-

ter to \$15 per kilogram. Hemlock Semiconductor parent company Dow Corning reported an ongoing slump in the business and “fewer polysilicon shipments to Hemlock’s long-term contract customers.”

There are few if any signs of improvement on the horizon. Bernreuter predicts that oversupply and collapsed prices will persist at least into early 2016.

Given new capacity coming online, these conditions may get even worse. In January Wacker Chemie plans to begin ramping its polysilicon facility in Tennessee, which will sell into the already oversupplied global market. Additionally, Hanwha is debottlenecking its production in South Korea.



Christian Roselund