

## Silicon Consumption to Drop to 3.6 Grams per Watt by 2020

**Bernreuter Research: Solar industry will reduce wafer kerf loss considerably**

**Würzburg (Germany), June 20, 2017** – The average silicon consumption for manufacturing multi- and monocrystalline solar cells will drop from 4.8 grams per watt (g/W) in 2016 by 25% to 3.6 g/W in 2020. This is the result of a new scenario developed by the polysilicon market research firm Bernreuter Research. “Besides the increasing market share of monocrystalline cells with their higher efficiencies, the rapid spread of diamond wire saws will considerably drive down the specific silicon consumption per watt,” says Johannes Bernreuter, head of Bernreuter Research and author of the *Polysilicon Market Outlook 2020*.

Compared with traditional wire saws, which work with a slurry of silicon carbide particles wetting the wire, diamond wire saws allow not only a higher throughput and lower costs in wafer production, but also the use of a thinner wire. While the technical limit of slurry-based wire saws lies at a wire thickness of 100 micrometers ( $\mu\text{m}$ ), diamond wire can be as thin as 60  $\mu\text{m}$  and thus reduce the kerf loss significantly.

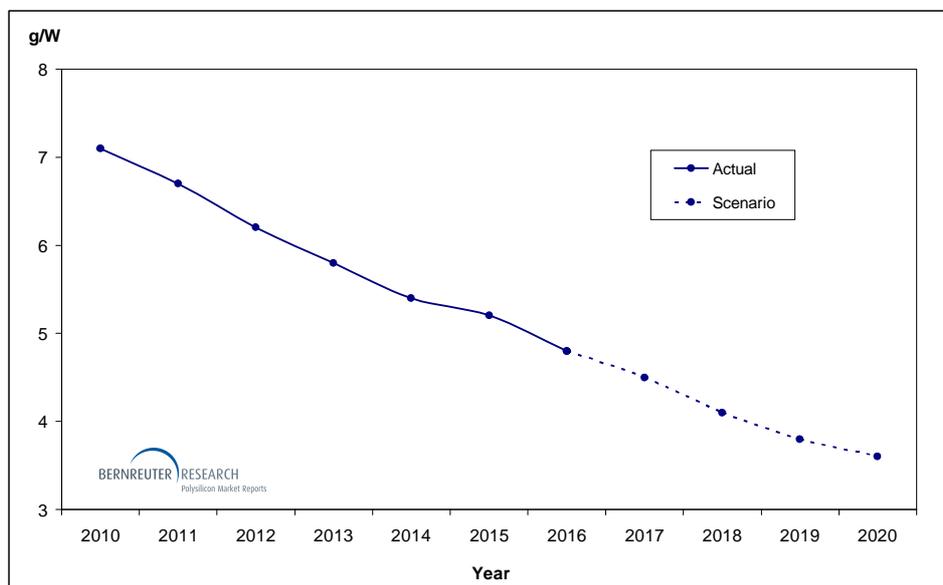
Diamond wire saws have already gained a large market share in the production of monocrystalline wafers, which have consequently become more competitive against the multicrystalline variant. In addition, LONGi Green Energy Technology, the largest manufacturer of monocrystalline wafers, is pushing monocrystalline technology with a massive expansion of its production capacity. Hence, Bernreuter Research assumes that the market share of monocrystalline wafers will rise from 27% in 2016 to 47% in 2020.

The increasing competition has forced the multicrystalline sector to solve the technical problem that has so far prevented the use of diamond wire for sawing multicrystalline wafers: Their surface becomes so smooth that it cannot be textured with the standard acidic etching solution. Meanwhile, the equipment manufacturers Schmid, RENA and RCT Solutions offer adapted etching processes using a metal catalyst or other additives, which are able to texture diamond-wire-cut multicrystalline wafers. GCL-Poly, the world’s largest manufacturer of multicrystalline wafers, as well as the big integrated solar module producers, such as Jinko and Canadian Solar, have already begun to switch from slurry-based to diamond wire saws. “Experts estimate that the transition will take four or five years for the whole industry,” says Bernreuter. “Therefore, we expect that more than 90% of multicrystalline wafers will be sawn by diamond wire in 2020.”

Even when using far more conservative assumptions, Bernreuter Research calculates an average silicon consumption of 4 g/W for 2020. Analyst Bernreuter warns that “the polysilicon industry has to prepare for the fact that demand is slowing down on two fronts: The annual growth rate of global photovoltaic installations is decreasing, and the polysilicon consumption for each new gigawatt installed in 2020 will be only half as much as it was in 2010.”

The *Polysilicon Market Outlook 2020* contains a detailed scenario of the solar industry's specific silicon consumption between 2014 and 2021, with data on ingot, wafer and cell yields, wafer thickness, kerf loss and market share of diamond wire saws, cell efficiencies and market shares of cell technologies. The 70-page report also provides bottom-up scenarios of polysilicon supply and demand, detailed forecasts of polysilicon prices and manufacturing costs through 2020 as well as the latest development of fluidized bed reactor technology. For more information on the report, please go to <http://www.bernreuter.com/en/shop/polysilicon-market-reports/market-outlook/report-details.html>

### Specific silicon consumption for solar cell production 2010 - 2020



The specific silicon consumption of the solar industry will halve between 2010 and 2020.  
Graphic: Bernreuter Research

### About Bernreuter Research

Bernreuter Research was founded in 2008 by Johannes Bernreuter, one of the most reputable photovoltaic journalists in Germany, to publish global polysilicon market reports. As early as 2001, Bernreuter authored his first analysis of an upcoming polysilicon bottleneck and new production processes. Since publishing its first report in 2010, Bernreuter Research has gained a reputation of providing the most comprehensive and accurate polysilicon reports on the market.

#### Press Contact:

Bernreuter Research · Polysilicon Market Reports  
Lessingstr. 6 · 97072 Würzburg, Germany

#### Your Contact Partner:

Johannes Bernreuter, Company Head  
Telephone: +49/931/784 77 81  
E-mail: [info@bernreuter.com](mailto:info@bernreuter.com)