Global Market

Global Market & Demand

There is no globally accepted High Purity Quartz (HPQ) specification. However, Sibelco markets its range of products under the brand name IOTA. IOTA categories are defined based on grade, application, purity, and individual elemental contaminations, and several HPQ classifications for benchmarking purposes are used internationally. A common categorization method is to use SiO2 content as a measure of HPQ quality as follows (Exawatt and ANZAPLAN, 2021).

- Low-grade HPQ is generally considered to be material of purity greater than 99.995% (or 50 ppm of impurities);
- Medium-grade material starting at 99.997% (30 ppm) impurities; and
- High-grade HPQ starting at 99.999% (10 ppm) after full processing.

IOTA has set a high purity benchmark for the rest of the HPQ market. It contains 20 ppm per million or less as a standard, equating to >99.998% of SiO2. The IOTA brand is the industry standard for high-quality fused quartz products. Its highest-quality grade used in significant volumes, IOTA6, is a chlorinated product that commands the highest prices of all HPQ types and is required for semiconductor crucibles, quartz glassware and optical fiber cladding. Sibelco’s higher-grade HPQ products such as IOTA8 are only produced in limited quantities.

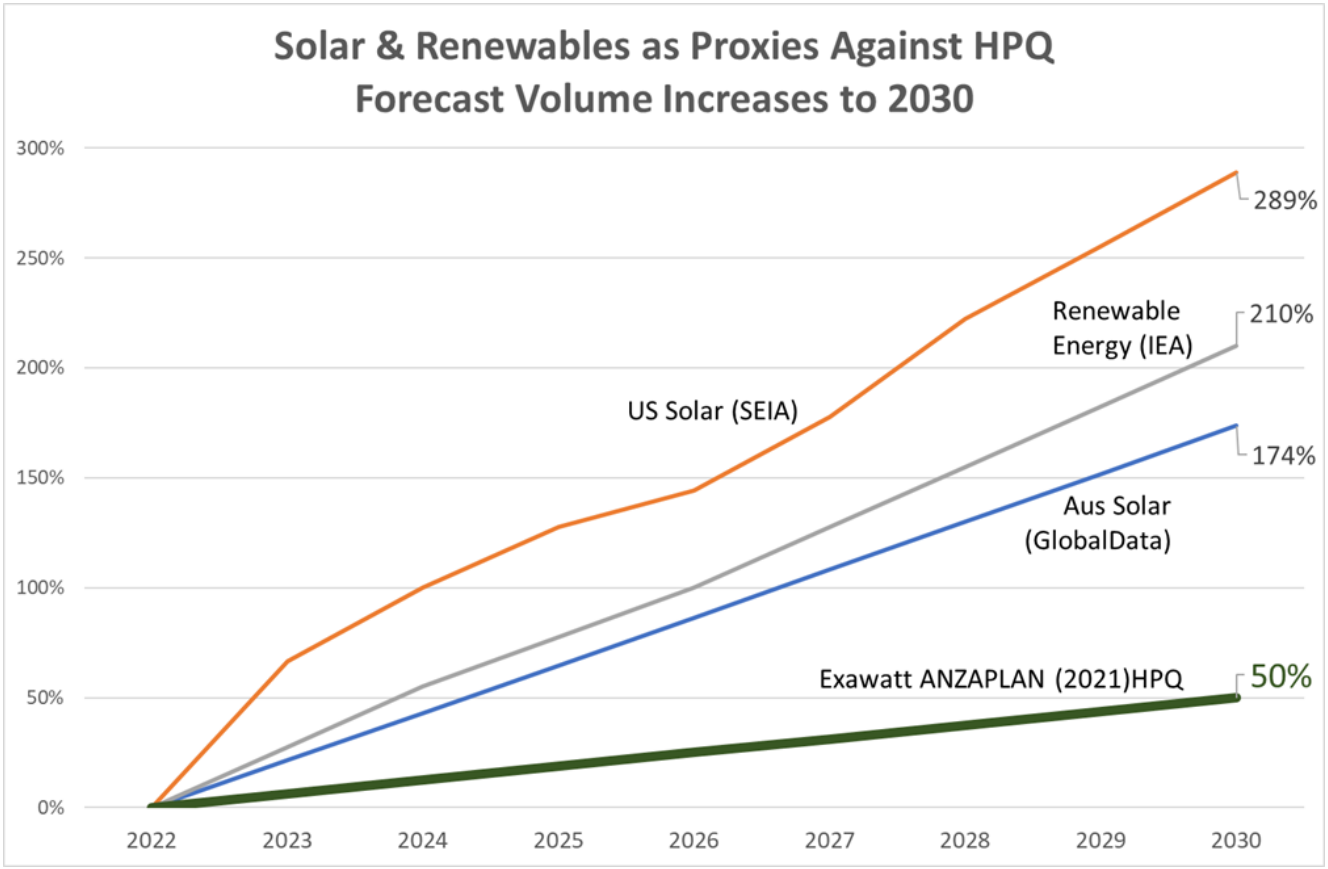
The table below has been compiled by Greentech from third-party sources, Exawatt and ANZAPLAN, 2021.

HPQ SAND	HPQ sand is high purity quartz silica with at least 99.99% (<100 ppm impurities). This sand is used in high purity epoxy fillers, ceramics, specialty glass and moulding compounds. Pricing is US$1,000 to US$2,000 per tonne.
GRADE I	Grade I HPQ includes high purity quartz having SiO_2 concentration >99.99% but <99.995% (50 to 100 ppm impurities. HPQ considered in the scope of Grade I is equivalent to the IOTA basic standard. Some of the common applications of Grade I HPQ include halogen and mercury lamps, optical glass, and custom production applications such as fused quartz tubing and ingots. Pricing is ~ US$4,000 to US$6,000 per tonne.
GRADE II	Grade II HPQ includes high purity quartz having SiO_2 concentration >99.995% but <99.998%. HPQ considered in the scope of Grade II is equivalent to IOTA 4 and 5 standards. Some of the common applications of Grade II HPQ are monocrystalline crucibles for solar applications, high-quality fused glass, tubing, and quartz-ware. Pricing is ~ US$6,000 to US$9,000 per tonne.
GRADE III	Grade III HPQ includes high purity quartz having SiO_2 concentration ≥99.998%. HPQ considered in the scope of Grade III is equivalent to the IOTA 8 standard. Some of the common applications of Grade III HPQ are semiconductor grade crucibles and high-end solar and semiconductor applications. Pricing is ~ US$8,000 to US$12,000 per tonne.

Please note that the above table is a guide only and illustrative of what prices the buyers of the Company's HPQF product may achieve once HPQF has been significantly processed. The Company cannot produce these products at present because it does not have the relevant beneficiation and purification assets.

The naturally occurring feedstock (HPQF) must be quartz of a sufficient grade and an amenable impurity profile to enable cost-effective upgrading to an IOTA or similar standard of specifications. Deposits of quartz that meet these specifications are very rare. The processing required to produce a particular HPQ grade depends on the amount and type of impurities present. It may include crushing, screening, flotation, acid washes, magnetic separation, and/or other physical, chemical, and thermal techniques.

HPQ demand is predicted to increase by over 50% in volume and 90% in value during this decade to a global $2B market by 2030. (Exawatt and ANZAPLAN, 2021)



Exawatt forecast low compared to renewables & solar forecasts