GREAT STONE
индустриальный парк

# HIGH-PURITY QUARTZ PRODUCTION

## PROJECT

There is provided a project on launching **high-purity quartz** (HPQ) **production**.

This is a high-opportunity project due to the following prerequisites:

- World HPQ market totals about **60 thou t** (app**. USD 500 mn**). The market is characterized of stable growth and annually increases by **3-5%**.
- Developed mining industry in Belarus, research and raw materials (the volume of identified quartz sand deposits is **175 mn t**) base.
- Skilled labor and experience in implementation of projects in quartz industry.
- Capital expenditures for the launching high-purity quartz production are estimated at **USD 30-70 mn**, payback period is **5-6 years**.

## MARKETS

**Customs Union market:**

- By 2020 Russia is planning to commission **152 GW** of solar power stations. Annual average capacity growth is expected to amount to **14%**.
- Russian microelectronics market is growing on average by **21%** a year. It is projected to reach **USD 2,84 bn** by 2015, thus having increased by 3 times since 2009.

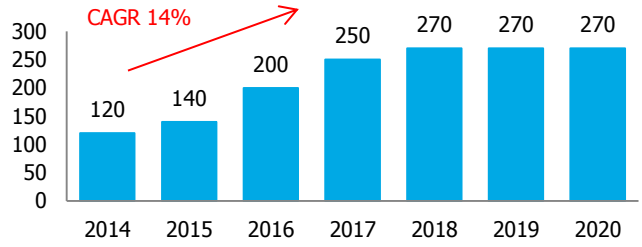
**Internal market of Belarus:**

- Integrated circuit output in Belarus increased by 1,5 times since 2005 and totals **1734 mn** pieces. Annual average growth rate is **6%**.
- There are 22 solar power stations in Belarus of total capacity of **1,89 MW**. National development program of local and renewable energy sources implies installing **172** facilities by 2015. By 2020 aggregate capacities are expected to get raised to **85 MW**.

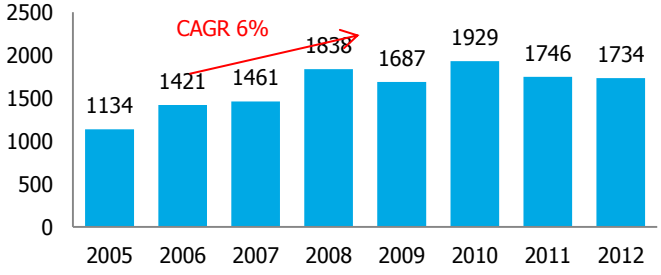
**European and South-East Asia markets:**

- Since 2009 world volume of solar battery installations is actively growing. In 2010 it increased by **172%**, in 2011 – by **40%** (CAGR **22%**). Leading countries: Germany, China, Japan, India, USA.
- The bulk of the electronic components market is accounted for by **APEC** countries (around **55%**), followed far behind by the USA and European markets.

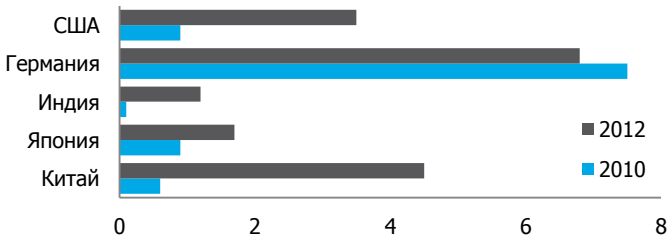
**Commissioning of solar power stations in Russia, MW**




**Integrated circuit output in Belarus, mn pieces**




**World volume of solar battery installations, GW**



# MARKET OPPORTUNITIES

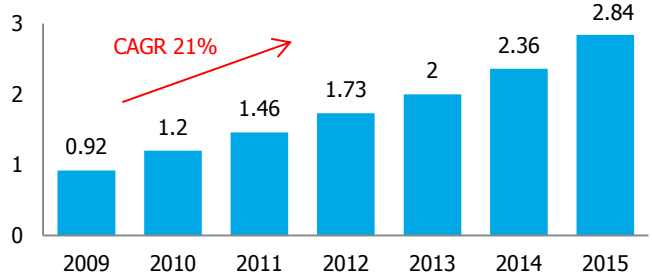
**Global opportunities:**

- World HPQ market totals about **60 thou t** (app**. USD 500 mn**).
- The market is characterized of stable growth and annually increases by **3-5%**.
- **60%** of global HPQ consumption is accounted for by **microelectronics** and **solar energetics**.
- World electronics industry is stably growing and reached **10,5 mn sq in** (**USD 338 mn**). With current growth rates, the market may double by 2017.
- Growth driver of HPQ market is **quartz crucibles market**. In 2013 it was estimated at **USD 434 mn** with annual average growth rate of **12%**.The bulk of the market is accounted for by quartz crucibles for semiconductor industry.
- Market of silicon for semiconductor industry is expected to grow at the level of **7%** a year.
- **35%** of all crucibles for microelectronics is of 300 mm technology process, **40%** - of 200 mm one. Demand for **quality products** will grow by means of gradual replacement of 200 mm technology process by 300mm and 450 mm ones.
- Global capacity of solar power stations exceeds **100GW**. Annual average growth rate of solar battery installations is projected to reach **22%**.
- Solar energetics market growth will trig the increase in share of crucibles for solar energetics up to **34%** in 2015 (compared with **21%** in 2008).
- HPQ market is monopolistic and characterized of constant price growth, quality issues, spot prices (customers' concern).

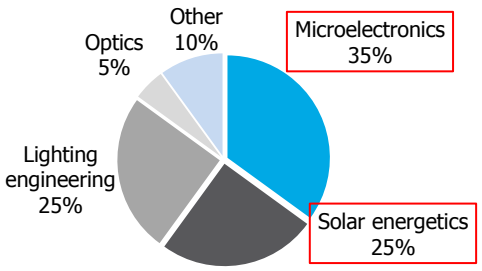
**Local opportunities:**

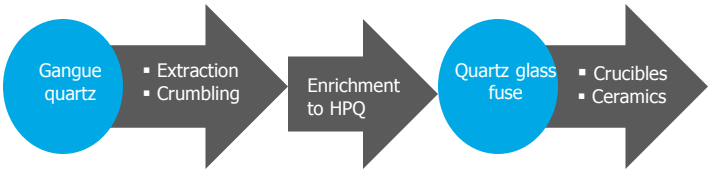
- Share of imported silicon on the Russian market is estimated at about **30%.** Necessity of importing high-purity quartz is conditioned by lower quality of silicon produced in Russia and inability of applying it in electronics industry.

**Russian microelectronics market, USD mn**

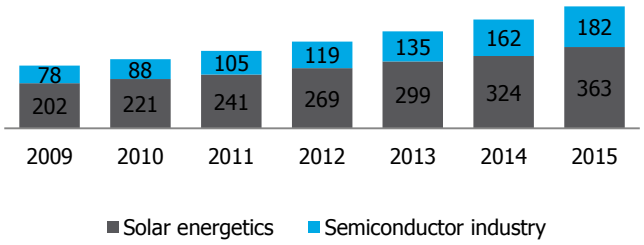



**Global HPQ consumption structure**

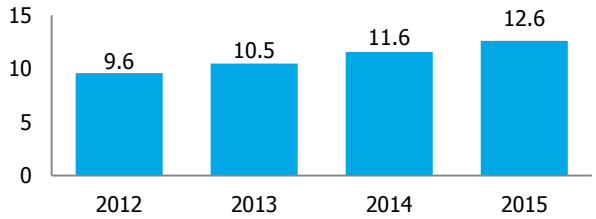


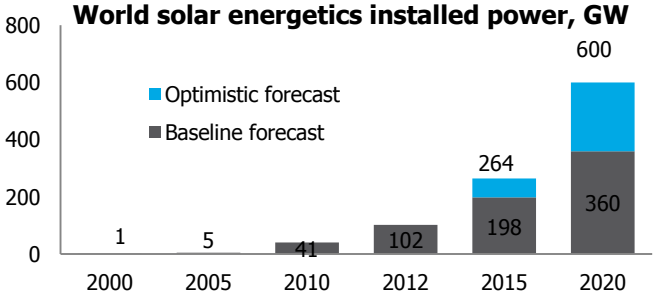

**Quartz crucibles market, mn USD**



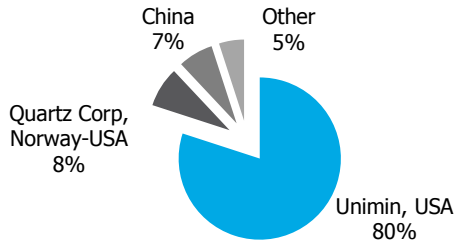

**Global electronics industry, mn sq in**




**World solar energetics installed power, GW**




**High-purity quartz market**



## INVESTMENT OPPORTUNITIES

- Capex for the project implementation might total **USD 30-70 mn**.
- Payback period is about **5-6 years**.
- IRR varies within **5-18%**.

## POTENTIAL INVESTORS

- **Strategic investors** – companies with appropriate technologies and experience in quartz production.
- **Forward integration –** world major players on microelectronics and solar energetics markets