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.

POLYSILICON PRODUCTION

PROJECT
There is provided a project on building a polysilicon production plant.
The project is considered high-opportunity due to the following prerequisite:
- World polysilicon market totals 145 thou t (USD 5 bn), annual average growth rate since 2009 – 20%.
- The main consuming industries – microelectronics and solar energetics with projected annual average growth rate of 7% and 24% respectively by 2020.
- 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 a polysilicon production plant start from USD 200 mn, payback period is 6-7 years.
MARKET OPPORTUNITIES

Global opportunities:

- World polysilicon market totals **145 thou t** (USD 5 bn), annual average growth rate over 2009-2013 – **20%**.
- The main consuming industries are **microelectronics** and **solar energetics** (35% and 25% respectively).
- Global electronics industry is stably growing, having reached **10,5 mn sq in** (USD 338 bn). With existing growth rates the market may double by 2017 compared to the current value.
- By 2015 demand of global electronics industry for polysilicon (EG) is estimated to increase to **47,2 thou t** per year.
- Capacity of world solar plants totals more than **100 GW**. Estimated annual average growth rate of solar battery installations is **22%**.
- Demand of global solar energetics for polysilicon (SoG) is projected at the level of **100 thou t** by 2015.

Local opportunities:

- Share of imported silicon on the Russian market is about **30%**. Silicon produced in Russia is of lower quality and can't be used in electronics industry.
- Russia: Alternative energy development program implying increase of its share in the country's energy balance up to **4,5%** by 2020.
- Europe: **The program 2020** (increase in share of renewable sources by 2020 up to 20%).
- Germany: “**Green tariff**” and “**Replacement of nuclear energy by solar by 2020**” programs.
- India: The program **20 solar GW** by 2020.
- Italy, Japan, China: **State programs** on alternative energy.
- USA: **USD 150 bn** is allocated for 10 years to support alternative energy.
- Kuwait: By 2020 **10%** of energy is to be produced from renewable energy sources.

Commissioning of solar plants in Belarus, MW

<table>
<thead>
<tr>
<th>Year</th>
<th>Capacity, MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>85</td>
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<td>2014</td>
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</table>

Projected demand of electronics industry for polysilicon

<table>
<thead>
<tr>
<th>Year</th>
<th>Demand for EG, thou t</th>
<th>Market volume, mn sq in</th>
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<tbody>
<tr>
<td>2012</td>
<td>35.8</td>
<td>9.6</td>
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<tr>
<td>2013</td>
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<tr>
<td>2014</td>
<td>43.0</td>
<td>11.6</td>
</tr>
<tr>
<td>2015</td>
<td>47.2</td>
<td>12.6</td>
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</table>

Demand of solar energetics for polysilicon, thou t

<table>
<thead>
<tr>
<th>Year</th>
<th>Demand for EG</th>
<th>Demand for SoG</th>
<th>Available capacities</th>
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<tbody>
<tr>
<td>2012</td>
<td>63</td>
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<td></td>
</tr>
<tr>
<td>2013</td>
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</tr>
<tr>
<td>2015</td>
<td>85</td>
<td>47</td>
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</tr>
</tbody>
</table>

Structure of world market for electronic components

APEC countries: 55%
INVESTMENT OPPORTUNITIES

- Capital expenditures for the project implementation start from USD 200 mn.
- Payback period of the project is 6-7 years.
- IRR varies within 13-15 %.

POTENTIAL INVESTORS

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