Becoming the World’s Leader in Producing Low Cost Green Solar Grade Silicon Metal
This presentation includes certain “forward-looking statements”

All statements, other than statements of historical fact, included herein, including, without limitation, statements regarding future plans and objectives of the company, are forward-looking statements that involve various risks, assumptions, estimates and uncertainties, and any or all of these future plans and objectives may not be achieved. The terms SGSI, Solar Grade Silicon and Polysilicon are used interchangeably and refer to high purity silicon used in the solar panel industry, with 99.999% purity, also referred to as “5N”.

These statements reflect the current expectations or beliefs of HPQ-Silicon Resources Inc. (“the Company”) and are based on information currently available to the Company. There can be no assurance that such statements will prove to be accurate, and actual results and future events could differ materially from those anticipated in such statements. All of the forward looking statements contained in this presentation are qualified by these cautionary statements and the risk factors described above. Furthermore, all such statements are made as of the date this presentation is given.

An investment in the Company is speculative due to the nature of the its business. The ability of the Company to carry out its plans as described in this confidential presentation is depending on obtaining the required capital. There is no assurance that the Company will be able to successfully raise the capital required or to complete each of the growth initiatives described. Investors must rely upon the ability, expertise, judgment, discretion, integrity and good faith of the management and Board of the Company.
HPQ IS DEVELOPING THE Disruptive Technology in **GREEN** Solar Grade Silicon Metal (SoG Si) required to meet the growing demand for Solar Energy

Each new GW of Capacity requires 5,000 tonnes of SoG Si

- Reaching 10% goal represent 540 K TPA annual demand for SoG Si
- Worldwide economically viable supply capacity is only 350 K TPA
- Building new supply Capacity is subject to significant Barriers to Entry
  - Depending on process CAPEX cost for 10 K TPA Plant Range from US$ 700 M to US$ 1 B
  - Low margin, Cash Cost between US $ 10 K to US$ 17 K, sales from US $13 K to US$ 16 K
  - Environmental permitting barriers are high because of nasty by-products (Hydrochloric acid (HCl) / H2 /Silicon Tetrachloride (SiCl4)) produced

**Source:** Canadian Solar
**Investment Proposition**

**HPQ is developing the PUREVAP™ Quartz Reduction Reactor (Patent Pending)**

**HPQ PUREVAP™ QRR Aims to Combine Two Processes and Transform Quartz Directly to Solar Grade Silicon**

 PUREVAP™ QRR **is a one step Carbothermic Process expected to:**

- Reduce Opex of making SoG Si by as much as 80%
- Reduce Capex Cost of making SoG Si by as much as 95%
- Reduce Carbon Footprint related to producing SoG Si by a minimum of 75%
- Eliminate the production of nasty by-products (Hydrochloric acid (HCl) / H2 /Silicon Tetrachloride (SiCl4))

*The results are radical but the science is simple!*
The cost curve for SG SI (polysilicon) suggest that long-term solar-grade polysilicon price below USD 15/Kg is not feasible. HPQ and the PUREVAP™ will challenge that.
Following Pilot Scale Validation of the PUREVAP™ QRR process;

- The goal will be to move to a commercial phase, with an objective of building capacity capable of producing 20,000 TPY of SG Si within 5-7 years
PUREVAP™
The Only Environmentally Friendly Option
Corporate and Capital Summary

<table>
<thead>
<tr>
<th>Share Price (June 19, 2017)</th>
<th>$0.125</th>
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<tr>
<td>52 Week Low</td>
<td>$0.105</td>
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<td>52 Week High</td>
<td>$0.305</td>
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<td>Shares Outstanding:</td>
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<td>Warrants:</td>
<td>66,465,139</td>
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<td>Options:</td>
<td>11,650,000</td>
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<td>Fully Diluted:</td>
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<td>Market Capitalization:</td>
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<td>Market Capitalization (FD):</td>
<td>$30,948,072</td>
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<table>
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<th>Cash and equivalent in hand</th>
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<td>Cash value of warrants in the money</td>
<td>$2,298,679</td>
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<table>
<thead>
<tr>
<th>Breakdown of warrants Outstanding</th>
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<td>6,325,000</td>
<td>$442,750</td>
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<td>$0.07 Strike Price Warrants - Feb. 18</td>
<td>1,800,000</td>
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<td>$0.07 Strike Price Warrants - Jun. 18</td>
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<td>$0.35 Strike Price Warrants - March 18</td>
<td>1,462,500</td>
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Management
- Bernard J Tourillon, BAA, MBA
  Chairman, CEO and Director
- Patrick Levasseur
  President, COO and Director
- Noelle Drapeau, LLL, MBA, PMP
  Corporate Secretary and Director
- Francois Rivard
  CFO

Independent Director (*):
- Richard Mimeau, B.Sc.
  Director
- Peter Smith, PhD, P. Eng.
  Director
- Robert Robitaille, B.A., L. Ph., MBA
  Director
- Daryl Hodges H. BSc, M.Sc.
  Director

Auditors
- Raymond Chabot Grant Thornton

Transfer Agent
- Computershares

Consultants
- Marcel Drapeau, BA, B.Sc. Comm, LLL
  Company Lawyer
- Marc Richer-Laflèche, P. Geo, PhD
  Technical Advisor (INRS- ETE)

Major Investors
- Management & Board ≈ 15% ≈ 22% (FD)
- Key Investor Group ≈ 14% ≈ 15% (FD)
- Fancamp ≈ 3% ≈ 5% (FD)
- Institutions ≈ 4% ≈ 5% (FD)
- Taiwanese Group ≈ 2% ≈ 3% (FD)
- PyroGenesis ≈ 2% ≈ 2% (FD)

TOTAL ≈ 39% ≈ 51% (FD)

Debt free after gold spinout

* Independent directors may receive additional compensation for project work.
HPQ Silicon plans to become a vertically integrated Silicon Metal Company

HPQ Silicon Resources Inc.

**Subsidiaries**
- BEAUCE GOLD FIELDS INC
- RONCEVAUX GOLD OPTION

**Divisions**
- QUARTZ PROPERTIES
  - Quartz Quarries
  - High Purity Quartz
    - by-products
  - Metallurgical Grade Silicon Metal
  - High Purity and Specialty Grade Silicon Metal
  - Solar Grade Silicon Metal
  - Polysilicon Wafers for Solar Cells

**Products**
- High Purity Quartz by-products
- Metallurgical Grade Silicon Metal
- High Purity and Specialty Grade Silicon Metal
- Solar Grade Silicon Metal
- Polysilicon Wafers for Solar Cells

**Purity**
- 99.99+% SiO2
- 98.5% to 99.5% Si
- 99.6% to 99.99+% Si
- 99.999+% Si

**Market Size**
- ≤ 100 K MT per Year
- ≥ 2.2 Million MT per Year
- ≥ 220 K MT per Year
- ≥ 350 K MT per Year

**Average selling price in Kg (USD)**
- $2.20 to $2.60
- $2.80 to $3.75
- $13.00 to $16.00

**2017, 2018 development steps for HPQ**
- Exploration work to start, goal delineating resources on Properties
- Following lab scale validation confirming capacity of taking 98.1 SiO2 feedstock and produce High Purity Si, the plans are to build a pilot system to confirm commercial scalability and study commercial opportunities for this significant market segment
- R&D ongoing, goal remains validating Purevap QRR capacity to produce 5N+ purity
- Studying business opportunities of expanding vertical integration further down the PV manufacturing cycle
- Following legal settlement, work on this significant hard rock gold project re-starting. Goal is transferring later at costs+ the project to BGF

**Gold assets are in the process to be spun out during 2017 to unlock value**

Ownership: 100% now, 20% after spin out
STRATEGIC DEVELOPMENT AGREEMENT WITH PYROGENESIS

- PyroGenesis is developing for HPQ-Silicon’s exclusive use the **PUREVAP™ QRR** (Patent Pending) a 1 Step, Clean Tech process for making SG Si directly from Quartz, using a plasma submerged arc
- HPQ has acquired the **intellectual property rights** to the **PUREVAP™ QRR** process and will finance the development as it relates exclusively to the production of silicon metal from quartz (*)
- PyroGenesis is building and will oversee production from a 200 TPY SG Si R&D pilot plant (Press releases August 2, 2016, September 30, 2015)

* PyroGenesis retains a royalty-free, exclusive, irrevocable worldwide license to use the process for purposes other than the production of silicon metal from quartz
**HPQ PUREVAP™ SCALING UP: Making Rapid Progress**

Proof of Concept Metallurgical Tests Program, Scaling up results

Thin layer of material produced during first tests

First nugget of Si (99.97% Si) produced during final proof of concept test (About 0.1 g)

15 tests later

Process Characterization Testing Phase, Scaling up results

Small bead produced during test #24

Series of chunks of 99.93 % Si produced during test #32 (8.8 g)

Series of chunks of 99.97 % Si produced during test #51 (8.67 g)

Modification done to the PUREVAP™ QRR have made it possible for test 51 to produce the same quantity of Si as in test #32, while using smaller batch sizes (55 wt% less)

**This represent a 531% increase in Yield !**
**COMPARISON of TODAY’S PROCESS Vs. PUREVAP™**

**MG SI Key Matrix (98% to 99.5% Si)**

- Market Size (Ton) = 2.2 Million Tons
- Market Size (US$) = 6 Billion
- Demand Growth = 6% CAGR
- Price (US$/kg) = 2.4 to 2.8
- Cash Cost (US$/kg) = 1.75 to 2.25
- Capex Cost (US$/kg) = 7 to 14

2015 Data (Sources CRU, Ferroglobe, Bloomberg, Viridis.oq, Roskill)

**Solar Grade SI Key Matrix (5N and Higher)**

- Market Size (Ton) = 350 K Tons
- Market Size (US$) = 5 Billion
- Demand Growth = 15% CAGR
- Price (US$/kg) = 12.80 to 15.67
- Cash Cost (US$/kg) = 12.0 to 17.0
- Capex Cost (US$/kg) = 75 to 100

2015 Data (Sources CRU, GTW, IEEE JOURNAL OF PHOTOVOLTAICS, VOL. 5, NO. 2, MARCH 2015, Bloomberg)

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**PUREVAP™ Quartz Reduction Reactor**

*A Proprietary (Patent Pending) One-step Process To Make Solar Grade Silicon Metal*

**“ELEGANT IN ITS SIMPLICITY”**

**SiO₂ 99.5% Carbon**

**SiO₂ 99.5% Coal - Wood Chips**

**H₂**

**MG Silicon Metal Is Dissolved In Hydrochloric Acid To Form Trichlorosilane (HSiCl₃)**

**Electric Arc Furnace**

**MG Silicon Metal 98.0% to 99.5% Si**

**Trichlorosilane (HSiCl₃) is Further Refined**

**SIEMENS Type Reactor have 90 % Market Share**

**Solar Grade Silicon Metal 99.999+% Si**

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**PUREVAP Process Key Working Matrix**

- Combine Market Size (Ton) >2.7 Million Tons
- Combine Market Size (US$) >11 Billion
- Demand Growth >10% CAGR
- Cash Cost (US$/kg) 1.75 to 2.25
- Capex Cost (US$/kg)
  - 7 (2 K TPY Reactor)
  - 4 (10 K TPY Reactor)

Capex Cost Sources from PyroGenesis Canada Rough Order of Magnitude Study, (Capex and Opex numbers to be refine after Pilot Plant start operation)

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**JUNE 2017 – Page 12**
### Design and Pilot Plant Fabrication Schedule

<table>
<thead>
<tr>
<th>Task Name</th>
<th>Schedule</th>
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<tbody>
<tr>
<td><strong>Phase 1: Detailed Engineering</strong></td>
<td></td>
</tr>
<tr>
<td>Process Engineering</td>
<td></td>
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<tr>
<td>Mechanical Engineering</td>
<td></td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td></td>
</tr>
<tr>
<td>Automation Engineering</td>
<td></td>
</tr>
<tr>
<td><strong>Phase 2: Pilot Plant Fabrication</strong></td>
<td></td>
</tr>
<tr>
<td>Equipment Sourcing</td>
<td></td>
</tr>
<tr>
<td>Equipment Delivery &amp; Inspection</td>
<td></td>
</tr>
<tr>
<td>Fabrication, Assembly &amp; Installation</td>
<td></td>
</tr>
</tbody>
</table>

**Phase 3:** Hot commissioning of Pilot Plant schedule from Nov 2017

**Phase 4:** Testing and Operating Pilot Plant schedule from March 2018
The total cost to purchase and commission the PUREVAP™ QRR Pilot Plant and related Intellectual Property is CDN$8,260,000 to be invested between 08/2016 en 12/2018:

- $1,000,000 for purchase of the related Intellectual Property (Completed)
- $4,430,000 for design, fabrication, assembly, and testing ($3,190,200 Completed, $1,239,800 by Nov-2017)
- $520,000 for hot commissioning of the pilot system (To be paid From Dec-2017 to Feb-2018)
- $2,310,000 for testing and operating the pilot system during 10 months (To be paid From March to Dec-2018)

The Projected Cash call over the next 24 months are:

- $1,499,800 for 2017, (To be paid From October 2017 to December 2017)
- $2,570,000 for 2018

HPQ Silicon funding advantages:

- The project is eligible for government funding (Provincial and Federal) for 55% to 80% of the cost
  - Discussion with both levels of Government are ongoing, approvals are expected during Q3 2017
- Over CDN$ 2,250,000 worth of warrants are in the money, majority in friendly hands
- The acquisition of PUREVAP™ Intellectual property opens up additional options for financing because investors want to see direct control over the key intellectual property
- Management is exploring several less – dilutive paths for financing the Pilot Plant
  - If the shares prices exceed $0.40, then over CDN$ 11,2 Million could be raised via warrant exercises
- HPQ will be entitled to R&D research credits on the CDN$7,260,000 investment
**HPQ - Silicon Resources**

- **HPQ-Silicon** is the largest holder of High Purity Quartz properties in Quebec, with over 3,500 Ha under claims.
- The Roncevaux High Purity Quartz, with it up to 3N purity (99.9% SiO$_2$) samples is in high demand, and has successfully passed rigorous testing protocols of a major silicon metal producer.
- The Martinville High Purity Quartz is unique and rare with samples up to 4N purity (99.99% SiO$_2$).
Plans Are To Establish HPQ Quarry Operations in order to meet our Raw Material Requirement For Future PUREVAP™ QRR Plants.

- For 2017, HPQ plans on developing the Roncevaux Quartz Potential:
  - Key goal, delineating a significant resource
- A Preliminary Economic Assessment (PEA), based on the fact that the PUREVAP™ QRR process is the only process in the world that can transform 98.1% SiO₂ into 99.9+% Si will be undertaken in 2018
- Until its completion, all our financial models will be based on purchasing the raw High Purity Quartz required for the plants, in the open market at market prices
- Upon successful start of quarry operations on Roncevaux, HPQ Silicon will be a fully integrated Silicon Metal Producer
Why Invest in HPQ Now?

HPQ Is Canada’s Only Public Pure Play Investment In the Growing Solar Grade Silicon Market

- HPQ Bench Test Success Have Validated That We Have The Only Process In The World That Purifies While Transforming Quartz Into Silicon Metal
- Project Graduating To Pilot Plant Phase

HPQ PUREVAP™ Proprietary Disruptive Technology:

- Low Opex, Low Capex, Minimal Carbon Footprint and Environmentally friendly
  - Less than 20% of the Industry’s cash cost,
  - 5% of Industry Capex, and
  - Estimated 75% reduction in carbon footprint
  - No nasty by-products (Hydrochloric acid (HCl)/H2/Silicon Tetrachloride (SiCl4))

- 200 TPY Pilot Plant almost completed and talking to potential industry partners
- The only one step process in the world that can take low quality feedstock (98.1% SiO₂) and produce High Purity Silicon Metal (99.97% Si)
Appendix: Supporting Slides
(slides 18 - 32)

Low Purity Feedstock
98.14 % SiO₂

High Purity Feedstock
99.9+ % SiO₂

PUREVAP™
“Feedstock Flexibility: A Visible Advantage”
From 2004, PV’s growth completely changed the dynamics of the polysilicon industry – visible first by strongly increasing prices and then by over-establishment of production capacity.
Low SG Si (Polysilicon) Production Limiting PV Growth

Source: Demand Data Installations: GTM Research, PV Pulse, January 2016
Supply Data: Competitor releases, industry analysts, REC Market Intelligence
Very Strong Growth in PV Demand

› China still most important market, but reduced installations in coming years

› India and other emerging markets continue to grow

› Long term market outlook is increasingly geographically diversified

PV Installations by Region

Results based on IHS Markit, Technology Group, PV Demand Market Tracker, Q4 2016. This data is not an endorsement of REC Silicon. Any reliance on the results are at the third party’s own risk. Visit www.technology.ihs.com for more details.
Competitors SoG Si Market projections

2016 Global Annual PV Installation Exceeding 81GW

CAGR: 38.1%
CAGR: 11.2%

Growth Drivers
- Grid Parity
- Environment Preservation
- Energy Security

Source: Global PV module demand assumptions from IHS and GTM Research
**PUREVAP™**

*The Only Environmentally Friendly Option*

**Carbon Footprint 75% Lower Than Conventional Process.**

The *PUREVAP™ QRR* process is estimated to generate 14.1 kg CO2 eq/Kg SG Si; The Siemens process (the industry standard) normally generates 54.0 kg CO2 eq/Kg SG Si of emissions.*

- This represents 75% fewer greenhouse gas emissions, which is justified by elimination of the emissions emanating from the use of chemicals, as well as, energy consumption from the additional purification step.

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China’s coal intensive electricity grid means that making silicon solar panels there – although cheaper – leaves a carbon footprint almost twice as large as that making it in Europe.

Source: Study led by Fengqi You at Northwestern University (Nature V 510, 19 June 2014)

Traditional process of transforming quartz in solar grade silicon metal represents the biggest contributing source to the lifecycle of CO₂ emissions for solar energy.

ADVANTAGE PUREVAP™ GOING FORWARD, AS MORE AND MORE SOLAR PRODUCER WILL BE ASK TO CONSIDER THE LIFECYCLE CO₂ FOOTPRINT OF THEIR PROJECTS
GROWING METALLURGICAL GRADE SILICON METAL MARKET

- MG Si 2015 consumption was 2.2 Million Tons;
  - > $US 6 billion in worldwide sales
- Demand is expected to grow at 6.0% CAGR from 2016 – 2020
- CRU forecasts a 2017-2020 price recovery for MG Si driven by rising MG Si demand
- In 2015, 15% of Global MG Si (98.5% Si) production was further refined to Solar Grade Si (SG Si, or “Polysilicon”) at 99.999% (5N) purity
  - 350 K Tons of SG Si was sold in 2015 (≈ $US 5Billion)
- Growth will be largely driven by the growing demand for Solar Grade (SG) Si (Polysilicon) material to be used in Photovoltaic (PV) solar panels
- Each Watt (W) of energy produced by a PV solar system demands ≈ 5 gr of SG Si
- GTM Research estimates that Installed PV demand to growth 15% - 23% annually, representing about 10 Gigawatt (GW) per year
- Significant SG Si Deficit are forecast from 2017 on as Gigawatt (GW) produce with Solar panels increases

Source: CRU 2015, Ferroglobe
Note: Silicon consumption, pricing, and capacity data are from CRU.
HPQ PUREVAP™ QRR Process Is Disruptive In The Traditional Silicon Metal Space With Its Capacity To Transform Low Purity SiO₂ Into 3N+ Si

Estimated Cost Advantages of PUREVAP™ Process

- Capex Cost of $4 (US$/Kg) annual capacity for 10,000 TPA VS $5 (US$/Kg) for 35,000 TPA
- Eliminating Woodchips usage could reduce Opex cost by US$ 175 per Tonne
- Recycling Carbon from the process could reduce Opex cost by another US$ 88 per Tonne
- Using lower Purity feed stock could reduce Opex cost by another US $15 per Tonne
- Recycling Carbon would render the process green and eliminate the need to buy Carbon credit

Source: Ferroglobe, CRU, HPQ
High Purity Si Competitors (2017)

Product Data Sheet
High Purity Silicon

Silicio FerroSolar offers High Purity Silicon for different applications fields such as the ceramic industry (for example ceramic bearings or cutting tools), pyrotechnical mixes, filler for epoxy in microelectronics, sputtering targets and aesthetical applications. Our production technology allow us to offer tailored solutions for each application.

Chemical composition

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<th>2N Spec.</th>
<th>3N Spec.</th>
<th>4N Spec.</th>
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<tr>
<td>Si Content (%)</td>
<td>&gt;99</td>
<td>&gt;99.9</td>
<td>&gt;99.99</td>
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**IMPURITIES (%):**

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<th></th>
<th>2N</th>
<th>3N</th>
<th>4N</th>
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<tbody>
<tr>
<td>Fe</td>
<td>&lt;0.50</td>
<td>&lt;0.05</td>
<td>&lt;0.005</td>
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<tr>
<td>Al</td>
<td>&lt;0.20</td>
<td>&lt;0.01</td>
<td>&lt;0.001</td>
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<tr>
<td>Ca</td>
<td>&lt;0.05</td>
<td>&lt;0.01</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ti</td>
<td>&lt;0.02</td>
<td>&lt;0.005</td>
<td>&lt;1 ppmw</td>
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<tr>
<td>P*</td>
<td>5-20 ppmw</td>
<td>5-20 ppmw</td>
<td>5-20 ppmw</td>
</tr>
<tr>
<td>B*</td>
<td>25-35 ppmw</td>
<td>25-35 ppmw</td>
<td>25-35 ppmw</td>
</tr>
</tbody>
</table>

*These are the typical range values for B and P. Any target value could be produced.

**Other trace elements on request

Particle size

Sizes could be adapted to the different needs.
Siemens reactors were originally developed for electronics; FBRs’ granular product is in general sufficiently pure for PV; upgraded MGS demands some adaption of downstream processes

<table>
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<tr>
<th>Impurity</th>
<th>Siemens (Solar) (value range)</th>
<th>FBR (value range)</th>
<th>U-MGS (value range)</th>
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<td>P (donor)</td>
<td>0.3-5 ppba</td>
<td>0.3-20 ppba</td>
<td>300-1,000 ppba</td>
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<tr>
<td>B (acceptor)</td>
<td>0.1-5 ppba</td>
<td>0.3-20 ppba</td>
<td>500-2,000 ppba</td>
</tr>
<tr>
<td>Total metals</td>
<td>20-50 ppbw</td>
<td>30-1,000 ppbw</td>
<td>100-1,000 ppbw</td>
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<tr>
<td>C</td>
<td>0.25-1 ppmw</td>
<td>0.5-10 ppmw</td>
<td>50-200 ppmma</td>
</tr>
<tr>
<td>O</td>
<td>0.5-5 ppmw</td>
<td>10-100 ppmw</td>
<td>(100 ppmw)</td>
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- Higher Metal concentration affects life time minority charge carriers lower cell efficiency
- Oxygen forms pair with B affects Light Induced Degradation (LID)
- Oxygen, Carbon, metals form inclusions which may destroy single crystal structure (CZ)
- High dopant (B, P) concentration compensation reduced material yield risk of LID risk of reverse current breakdown


*) Sun Edision in their now shuttered US FBR-facility regularly made electronic grade polysilicon and their Korean JV (“SMP”) also, reportedly, is capable of producing electronic grade product.
Elkem Solar production process

- **Silicon**: Metallurgical silicon is produced from quartz in an electric arc furnace, at temperatures above 2,000 degrees C.

- **Slag treatment**: A purification process, in which the molten silicon is mixed with slag, in order to extract further impurities, especially boron.

- **Leaching**: A "wet" chemical refining process that removes phosphorous and metallic impurities from silicon in solid form.

- **Solidification**: The silicon is melted and directionally solidified through which impurities are segregated and thereafter removed in the subsequent post-treatment process.

- **Post treatment**: Surface washing and cutting.
Elkem Solar targets a superior cost position

Ongoing technology development to eliminate two process steps

Elimination of two process steps will reduce cost of Elkem Solar Grade Silicon significantly
SIMPLE PUREVAP™ 1-STEP PROCESS
“ELEGANT IN ITS SIMPLICITY”

Quartz Reduction Reactor
- Quartz reduction with carbon using plasma submerged arc
- Silicon refining under vacuum to remove impurities

Vacuum Arc Furnace
- Reaching very low air pressure level
  ✓ (m bar)
- Very high temperature plasma arc
  ✓ +3500 degC
- Resulting in vaporized impurities before Si can vaporize
  ✓ P, K, Mg, Zn, Ca, Mn, Pb, Al, Fe, etc

Solar Grade Silicon Metal “Polysilicon”
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