SRI International has developed a novel production process for manufacturing solar-grade silicon that is:

- **Low-cost**: half the cost of Si produced using Siemens Process
- **High-purity** (<0.02 ppm of impurities)
- **Suited to use in single crystal, polycrystalline, or silicon film ribbon production**
- **Ready for large-scale production, with much lower CapEx than required for a Siemens-type plant**

### Market-Ready to Meet Growing Demand for Solar-Grade Silicon Feedstock

Demand for solar energy is growing rapidly as a result of both consumer interest and public policies designed to address environmental and energy security concerns. SRI’s technology addresses the industry's critical need for a process to produce low-cost solar-grade silicon.

Our silicon production process uses only low-cost, readily available starting materials, primarily sodium and hexafluorosilicate (which is converted into silicon tetrafluoride). Benefits of this process include:

- Atmospheric pressure operation
- High-throughput batch or semi-continuous operation
- Low power compared to alternative processes
- Low capital requirements
- High yield

Silicon produced from our process has been grown into single crystal solar cells with efficiencies in excess of 15 percent. The technology has the potential to be used directly to obtain cast polycrystalline silicon ready for wafering. As a result, companies may be able to integrate vertically with production of single crystal or polycrystalline silicon ingots for photovoltaic cell production.

### SRI’s low-cost solar-grade silicon process produces silicon feedstock for single crystal, polycrystalline, or silicon film ribbon.

SRI’s bench-scale reactor has produced 4.0 kg Si/hour (equivalent to 10-15 tonnes/year). SRI has designed a production reactor for 1000 tonne/year.

### Technology Commercialization

Thus far, SRI has entered into seven licenses for its silicon production process and intends to expand its activities in this area by entering into additional licenses.

Potential partners include:

- Established and new silicon producers
- Solar cell makers who need a reliable, low-cost internal source of silicon
- Chemical companies that want to enter the solar silicon supplier market
- Entrepreneurs

### Market Entry Timeline

SRI works with its licensing partners to transfer the technology. Although timing will vary with each partner’s commitments and schedule, SRI anticipates that partners will be able to complete construction along the following timeline:

- Months 0 to 6: transition technology and design pilot plant (~25 tonne/year)
- Months 6 to 18: start-up pilot plant; expand design to 1000 tonne/year plant
- Months 18 to 36: build 1000 tonne/year plant
SRI’s Experience with Solar Initiatives

SRI has been involved in many aspects of the solar cell industry, including

- Production of materials for solar cells (e.g., silicon, cadmium telluride, copper indium diselenide)
- Development of diffusion, metallization, and passivation technologies
- Deposition of thin and thick films on a variety of substrates
- Solar concentrator design
- Technology evaluation
- Consulting for corporations seeking to enter the solar cell value chain

Contact Us

Richard Abramson  
Vice President  
Legal and Business Affairs  
solarsilicon@sri.com  
650.859.6068

About SRI International

Silicon Valley-based SRI International, a nonprofit research and development organization, performs sponsored R&D for governments, businesses, and foundations. SRI brings its innovations to the marketplace through technology licensing, new products, and spin-off ventures. Commemorating its 65th anniversary in 2011, SRI is known for world-changing innovations in computing, health and pharmaceuticals, chemistry and materials, sensing, energy, education, national defense, and more.

Headquarters: Silicon Valley  
SRI International  
333 Ravenswood Avenue  
Menlo Park, California 94025-3493  
650.859.2000

Washington, D.C.  
SRI International  
1100 Wilson Blvd., Suite 2800  
Arlington, Virginia 22209-3915  
703.524.2053

Princeton, NJ  
SRI International Sarnoff  
201 Washington Road  
Princeton, New Jersey 08540-6449  
609.734.2000

Additional U.S. and international locations

www.sri.com

SRI International is a registered trademark of SRI International. All other trademarks are the property of their respective owners.

Copyright 2011 SRI International.  
All rights reserved. 03/11