**Sol Voltaics Unveils Sol*Ink*™ to Boost Performance of Solar Modules by 25 Percent**

*Manufacturing in the air: Aerotaxy™ process reduces the cost and complexity of producing nanowires for solar modules, LED bulbs and other products.*

April 09, 2013 LUND, SWEDEN—Sol Voltaics today unveiled Sol*Ink*™, an economical nanomaterial that promises to increase the efficiency of crystalline silicon or thin film solar modules by up to 25 percent or more, leading to solar power plants and rooftop solar arrays that will generate far more electricity than today's best commercially available systems.

The increase in efficiency will allow Sol*Ink*-enhanced panels to deliver power at prices that competes directly against electricity from fossil fuel plants while improving the economics for manufacturers. Global demand for solar energy is expected to grow from 29.8 gigawatts of new solar installations in 2012 to 50.8 gigawatts in 2016, according to Greentech Media.

"The best way to lower the cost of solar power is to raise the efficiency of solar modules," explained David Epstein, CEO of Sol Voltaics. "Approximately two-thirds of the cost of commercial solar systems revolves around land, labor costs and other factors that solar developers can't directly control. By raising the efficiency of solar modules, we give solar manufacturers the opportunity to sell more valuable, higher-margin products and solar developers the opportunity to generate more power--at a lower price--with essentially the same physical assets."

To date, Sol Voltaics has raised $11 million from private investors including Industrifonden, Foundation Asset Management of Sweden, Teknoinvest, Provider, Nano Future Invest and Scatec Energy of Norway. The company additionally has received public funding from the European Union, Vinnova, Nordic Innovation Center, and others. Sol Voltaics will raise $10 to $20 million this year.

Sol Voltaics' strategy revolves around two fundamental technologies: gallium arsenide nanowires, thin strands of material that constitute the active ingredient in Sol*Ink*, and Aerotaxy™, an innovative process for producing nanowires created by company founder and Lund University professor Lars Samuelson.

Gallium arsenide has been used in solar for years because of its reliability and high conversion efficiencies: orbiting satellites employ solar cells made from the material to power their internal systems. Gallium arsenide solar cells, however, typically cost far more to produce than crystalline silicon or thin film cells, thereby confining the material to niche market segments.

Sol*Ink* dramatically reduces the cost by minimizing materials: less than a gram of nanowires is added to crystalline silicon panels. With Sol*Ink*, module manufacturers can make commercially feasible, high efficiency gallium arsenide solar modules or multi-junction solar modules combining gallium arsenide and crystalline silicon.

Sol*Ink* also enables light concentration without the use of optics or mechanical components. Nanowires need only cover a small portion of the surface area of a crystalline silicon or thin film solar cell to achieve substantially all of the benefits of adding gallium arsenide. In a research paper published in Science earlier this year, Lund University and Sol Voltaics researchers demonstrated that indium phosphide

nanowires covering just 12 percent of the substrate surface produced a solar cell with an efficiency of 13.8 percent. The results were certified by the Fraunhofer Institute. The phenomenon, called Wave Concentrated Photovoltaics (WCPV), combined with the other advantages of gallium arsenide nanowires leads to ground-breaking performance for Sol*Ink*.

**Aerotaxy: A New Way to Manufacture Materials**

Aerotaxy represents a new paradigm for mass producing the smallest structures inside electronic devices. Nanowires and nanotubes are typically produced through an epitaxial process, i.e. slowly grown as crystals on substrates. Because of the inherent physical limits of the epitaxial process, nanoparticles often need to be grown in place or harvested and sorted in batch processes that can be both time-consuming and expensive.

Aerotaxy creates nanomaterials by suspending and mixing active materials in carrier gas streams. The active materials bond to form larger, uniform structures while in flight: nanowires are literally grown in air. In this way, Aerotaxy can generate tens of billions of nanowires per second on a continuous basis.

The finished nanowires can be integrated into a solar panel or other products, or can be stored indefinitely. A 2012 paper published in Nature details how professor Samuelson and his team manufactured gallium arsenide nanowires with Aerotaxy.

“The results have been far better than we ever expected,” said Samuelson. “We understand how different materials react or bond to one another. With Aerotaxy, we essentially create an atmosphere where we can better harness those physical and chemical properties.”

**Business Model: Sol*Ink*, Not Modules**

Rather than produce modules or sell capital equipment, Sol Voltaics will produce and sell Sol*Ink* to solar cell and module manufacturers: a single, relatively small, manufacturing facility will be able to provide megawatts worth of materials to module makers worldwide. Module manufacturers likewise will be able to integrate new materials into their products without replacing existing production lines.

Sol Voltaics anticipates producing functional solar cells with gallium arsenide nanowires for demonstration by the end of 2013. Commercial production of Sol*Ink*-enhanced modules will begin in 2015 and move into volume production in 2016. Total invested capital to get into high-volume commercial production will come to less than $50 million.

Other potential applications for Aerotaxy include producing nanomaterials for power electronics, LEDs, batteries and energy storage.

“The promise of nanotechnology has been held back by complexity, low yields and cost. Aerotaxy paves the way for integrating new materials into products in a streamlined manner. This is nanotechnology made simple,” said Alf Bjorseth, Chairman of Scatec.

**About Sol Voltaics:** Based in Lund, Sweden, Sol Voltaics develops novel nanomaterials and production processes for enhancing solar panels and other products. To learn more, please visit www.solvoltaics.com.

Press Contact

Michael Kanellos

Vice President

Eastwick Communications

(415) 820-4176

Kanellos@eastwick.com